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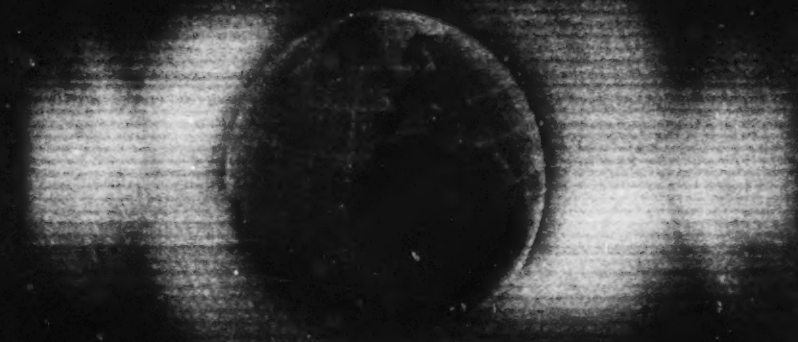
# Climate Change and Greenhouse Gas Awareness Study



March 2003

Canada

# CLIMATE CHANGE AND GREENHOUSE GAS AWARENESS STUDY

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**Keywords:** climate change, greenhouse gas (GHG) emissions, environment, environmental farm management plan, carbon sink/sequestration practices, emissions trading market, manure.

# Foreword

In 1997, industrialized countries agreed on the Kyoto Protocol that, when in effect, sets binding greenhouse gas emission targets for developed countries for the five-year period 2008 to 2012. If Canada ratifies the Protocol, it will be required to reduce its greenhouse gas emissions to six percent below 1990 levels during this period.

In response to the 1997 Kyoto Protocol (KP) the First Ministers directed Ministers to examine the impacts, costs and benefits of implementing the KP as well as the options for addressing climate change. In 1998, the Energy and Environment Ministers responded by establishing the National Climate Change Process that established 16 Issues Tables/Working groups to examine options for reducing Canada's GHG emissions. In 2000, building on the work of the National Process, the Energy and Environment Ministers moved forward with a coordinated national approach to climate change. This included the National Implementation Strategy and the First National Business Plan, which organizes individual and cooperative action under the key themes of Phase One of the Strategy. One of the key themes of the Strategy is enhancing awareness and understanding to inform, educate and build awareness of the science and impacts of climate change, including the capacity to adapt, and develop broad support for making climate change a priority.

This study responds to the e· hancing awareness and understanding theme of Phase One of the Strategy. It was undertaken by Agriculture and Agri-Food Canada to assess the level of awareness and understanding of producers regarding climate change and GHG issues. This study also contributes to Canada's response to Article 6 of the Kyoto Protocol Convention that seeks to promote action at the national level to provide the education, training and public awareness needed to understand and to deal with climate change.

This study establishes a baseline measurement that will be used to evaluate the success of the awareness and public education effort towards climate change and GHG. Results of this study will also enhance the development of effective programs and policies therefore contributing to the effort of the agriculture sector to reduce its share of GHG emissions.

The issue of climate change must also be seen within the broader policy context of sustainable development as the environment is a key element of the 2001 Agricultural Policy Framework. The Framework commits federal, provincial and territorial governments to work with producers and others to address environmental concerns by helping farmers adopt environmentally sustainable practices.

# Executive Summary

Agricultural production activities are responsible for about 10% of Canada's greenhouse gas (GHG) emissions. With ratification of the Kyoto Protocol, Canada would need to reduce its GHG emissions for the first commitment period of 2008–2012 to 94% of 1990 emission levels. Currently, analysis and consultations are underway to understand how each sector could contribute to this national goal in a cost-effective manner.

The objective of this report is to provide baseline information on the extent to which producers understand the issue of climate change and GHG emissions and how this issue relates to the soil, land and livestock management choices that they make. This information will support governments and industry in developing the policies and measures that will help Canada reach its goals of reducing GHG emissions while maximizing the potential environmental benefits that might be associated with such action.

Agriculture and Agri-Food Canada commissioned Léger Marketing to conduct a national survey of 1,643 producers to determine their awareness of climate change and GHG emissions and their understanding of the role of agriculture in the emissions of GHG. Interviews were completed in January/February 2001 with producers whose main farm type was field crops, beef cattle, dairy, hogs or poultry with annual gross farm revenue over $10,000.

An overwhelming majority of producers (85%) stated that they were exposed to agriculture information relevant to their farm operation in the last year. In contrast, the exposure to climate change and GHG information was limited as only one out of four producers (24%) received information on it. However, exposure does not necessarily translate into a greater willingness to reduce GHG emissions or to agree that agricultural activities have an impact on GHG emissions.

Seven out of ten producers (70%) say they are interested in receiving factual information on GHG emissions from the government. The most frequently cited sources of agricultural information are producer associations (77%), government (49%) and industry (47%). The survey reveals that almost half of the producers (45%) are connected to the Internet. Although those who are connected use it frequently, only 13% mention using it as a means to receive agricultural information.

Almost half of the producers (45%) agree that the Kyoto Protocol brought countries together to reduce GHG emissions. However, producers are less informed about the specific aspects of GHG's only one out of four properly identified agriculture's contribution to GHG emissions or the predominant GHG associated with agricultural activities. Producers considered water pollution and soil erosion as the two most important impacts of agriculture activities on the environment. Only one out of four producers (23%) selected climate change as an impact of agriculture activities

Views on the long-term impacts of climate change on agricultural activities are heterogeneous. More than half of the producers believe that climate change will have an impact with 30% expecting a positive impact and 26% a negative impact. However, a large proportion (34%) believe there will be no impact. Producers with high farm sales are more inclined to view climate change positively. The introduction of new crop varieties and an increase in extreme weather events were most often mentioned as the expected impacts of climate change on agriculture.

Most producers are unaware of the link between GHG emissions and common agricultural practices (the use of zero tillage, shelters belts, intensive grazing, growing more forage and the increased use of inorganic fertilizer).

Only one out of six producers (16%) is familiar with carbon sequestration or carbon sink farming practices or what role an emissions trading market might play if Canada decides to create one. Field crop producers are more familiar with these concepts, as are producers with higher farm sales and producers who frequently attend seminars or take training courses.

In trying to relate farm management practices to GHG emissions, the survey found that only one out of seven producers (14%) with seeded cropland use zero till technology as their main tillage practice. Two thirds of producers still use conventional tillage as their main tillage practice. Less than half (38%) conduct soil tests for nutrient management on an annual basis. Only a third apply manure on their fields on a regular basis acccording to the results of soil tests.

About a quarter of producers (23%) do have a formal environmental farm management plan. Producers with a formal environmental farm management plan tend to employ better farming practices such as conducting soil tests more frequently for nutrient management and before applying manure. Among the producers who have a formal environmental plan, 42% are very interested in a program to help them develop one compared with only 15% among those who do not have a formal plan.

Producers indicated that government assistance or support would not provide a major incentive to increase their willingness to change their farming practices to reduce GHG emissions. Even when help is proposed through government programs or through financial incentives such as an emissions trading market, the majority of producers are either not interested or unsure about adopting practices that would reduce GHG emissions. This result is not surprising considering the general lack of knowledge of the impact of agriculture practices on GHG emissions, the impact on their own cost structure, and the lack of familiarity with concepts such as emissions trading market.

Overall, the results of the survey show that producers have a general lack of understanding of agriculture's contribution to GHG emissions and climate change. The results also indicate that there may be a low level of acceptance of mitigation policies and measures if the level of

understanding is not increased first. Producers must be able to see the link between GHG emissions and their present agricultural practices, how this link relates to other environmental issues, and how any action they may decide to take could affect their competitiveness. Producers manage a complex, integrated system. They cannot deal with most issues on a one-off basis. On this basis, the issue of GHG emissions and policy developed to respond to this issue must be placed within the broader context in which producers operate.

# Section 1: Objectives and methodology

Section 1 outlines the four objectives of the survey, the main farm types sampled, the methodology, the sample size and margin of error, and the quantitative and qualitative research used for this report.

## 1.1 Background

In the fall of 2000, Agriculture and Agri-Food Canada (AAFC) commissioned Léger Marketing to conduct a benchmark survey with producers across Canada. Interviews were completed in the spring of 2001 with 1,643 producers and focused on their level of awareness, understanding and perception toward climate change and greenhouse gas (GHG) issues.

Climate change and GHGs are emerging issues facing producers. With the ratification of the Kyoto Protocol, Canada would need to reduce its GHG emissions for the first commitment period of 2008-2012 to 94% of 1990 emission levels. Agriculture is responsible for about 10% of Canada's GHG emissions, not including the use of fossil fuels or the indirect emissions from fertilizer production.

## 1.2 Objectives

This report tries to indicate the policy implications for government as suggested by the current level of awareness regarding climate change and GHG emissions among agricultural producers. The report also considers their actual behaviour directed at mitigating GHG emissions and how this behaviour affects government policies.

The report has four objectives:

- to measure the level of awareness and understanding of producers toward climate change and GHG issues
- to identify the use of certain current agricultural practices that relate to GHG emissions

- to measure producers' level of commitment in adopting new farming practices to reduce GHG emissions on their farms
- to establish a baseline measurement that will evaluate the success of awareness and public education programs on climate change and GHG emissions.

## 1.3 Report structure

The report is structured into eight sections. In Section 2, *Description of producers* we present their socio-demographic profile and their farm status while in Section 3, we evaluated their *Exposure to agricultural and environmental information*. Section 4, *Farm business management practices* assess producers frequency of use of those management practices and their level of agreement with some statements related to them. Section 5, evaluates producers *Awareness and familiarity with climate change and GHG issues* while Section 6 describes producers' *Behaviour related to GHG emissions*. Section 7, *Qualitative research–communicating the message* describes focus groups suggestions to improve the dispersal of information and awareness towards climate change and GHG emissions. Section 8, *Summary and recommendations* closes the report.

## 1.4 Main farm type

The questionnaire was designed to represent a cross section of five farm types across Canada:

- field crops
- beef
- dairy
- hogs
- poultry.

Producers reporting horticulture were included in field crops. For reporting purposes, efforts were made to ensure sufficient representation from each farm type on a national basis and from each province (except for the Atlantic provinces). Additional samples were allocated to field crop and beef producers in the prairie provinces and Ontario, as well to milk and hog producers in Ontario and Quebec to provide statistically significant estimates on a provincial basis for these farm types.

## 1.5 Methodology

A producer profile from across regions, farm type, farm sales, education, age and years as main/joint decision maker is presented in Section 2. This profile reflects different levels of knowledge and awareness toward climate change and GHG issues and different behaviours that relate to the mitigation of GHG emissions.

Some results contain "aided" and "unaided" responses. For others questions, interviewers read a list of possible answers and producers were asked to select what they thought were most appropriate.

Statistical analysis was applied to raw results: cross-tabulation, descriptive statistics and correlation analysis. The comparative information by segments refers to any significant difference in behaviour of a specific sub-segment compared with other segments in the same demographic category (significance of 95% confidence level).

To determine the most appropriate policy measures, an effort was made to highlight in the text the discriminating differences in attitudes and behaviour that relate to the mitigation of GHG emissions. Where there is no significant difference ($P > 0.05$) between variables (ex: by farm type or by provinces/region), the data (text, graph or table) is not presented in the text.

## 1.6 Sample size and margin of error

The survey was conducted by starting out with a list (the "sampling frame") of all units in the Canadian farm population (184,276 farms) from which we took a random sample of 1,643 farms.

In a scientific survey, every unit in the population has some known positive probability of being selected for the sample and the probability of any particular sample being chosen can be calculated. An important factor in determining the margin of error is the size of the sample. Larger samples are more likely to yield results close to the target population quantity and thus have smaller margins of error than more modest-sized samples. As an example, the large sample of 1,643 Canadian farms in this survey has a margin of error of only +/- 2.4%. However, the poultry sub-group with a modest sample of 146 farms is accompanied by the larger margin of error of +/- 8.0%. The lower the margin of error, the more accurately the views of those surveyed match those of the entire population.

The laws of probability make it possible for us to calculate intervals in the form of estimate +/- margin of error. Such intervals are sometimes called 95% confidence intervals and would be expected to contain the true value of the target quantity (in the absence of non-sampling errors) at least 95% of the time. In other words, if we had asked a survey question 100 times, then 95 times the results would be within 2.4% of the original answer at the national level. Of course, the other five times we would have asked that question, we could have received questionable answers. For example, if 50% of our sample of 1,643 randomly selected producers said they had an environmental farm management plan, then in 95 cases out of 100, 50% of the entire Canadian farm population would also have given the same response had they been asked, give or take 2.4% (i.e. the true proportion could be between 47.6% and 52.4%). In the poultry farm type example, if 50% of our sample of 146 randomly selected poultry producers said they had an environmental farm management plan, in 95 cases out of 100, 50% of the entire poultry farm population would also have given the same response had they been asked, give or take 8.0% (i.e. the true proportion could be between 42.0% and 58.0%).

Table 1a provides the survey sample and the margin of error by farm type. Table 1b provides the survey sample and the margin of error by province. Table 2 provides the survey sample of completed interviews in absolute values.

**Table 1a: Margin of error by farm type**

| Farm type | Population(a) | Survey sample | Margin of error (%) |
|---|---|---|---|
| Field crops(b) | 95,135 | 495 | ±4.4 |
| Beef | 53,973 | 477 | ±4.5 |
| Dairy | 23,448 | 289 | ±5.7 |
| Hogs | 7,697 | 236 | ±6.3 |
| Poultry | 4,023 | 146 | ±8.0 |
| TOTAL | 184,276 | 1,643 | ±2.4 |

**Table 1b: Margin of error by province/region**

| Province | Population(a) | Survey sample | Margin of error (%) |
|---|---|---|---|
| British Columbia | 8,404 | 101 | ±9.7 |
| Alberta | 41,435 | 277 | ±5.9 |
| Saskatchewan | 47,553 | 223 | ±6.6 |
| Manitoba | 17,534 | 222 | ±6.5 |
| Ontario | 39,699 | 421 | ±4.7 |
| Quebec | 25,009 | 290 | ±5.7 |
| Atlantic provinces | 4,649 | 109 | ±9.3 |
| TOTAL | 184,276 | 1,643 | ±2.4 |

(a) Source: 1996 Census of Agriculture. Minimum annual gross farm sales of $10,000.
(b) Includes horticulture producers.

**Table 2: Completed interviews**

| | B.C. | Alta. | Sask. | Man. | Ont. | Que. | Atl. | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Field crops | 29 | 106 | 100 | 102 | 109 | 30 | 19 | 495 |
| Beef | 20 | 114 | 100 | 80 | 99 | 30 | 35 | 477 |
| Dairy | 26 | 26 | 9 | 10 | 83 | 100 | 35 | 289 |
| Hogs | 1 | 20 | 4 | 20 | 81 | 100 | 10 | 236 |
| Poultry | 25 | 11 | 10 | 10 | 50 | 30 | 10 | 146 |
| TOTAL | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1,643 |

Source: Léger Marketing

## 1.7 The quantitative research

The quantitative research targeted all Canadian farms with annual farm sales over $10,000 (before deductions). Producers are the main or joint decision makers for their farm operations. The response rate was 29%. The average duration of the interview was 22 minutes.

The questionnaire (Appendix B) was developed in conjunction with AAFC and various provincial stakeholders. Two focus groups in London, Ontario (field crop producers and livestock producers) helped to define the central issues for the questionnaire.

## 1.8 The qualitative research

The quantitative research with 1,643 producers was followed by qualitative research involving six focus groups in six locations: Charlottetown, Prince Edward Island; Sherbrooke, Quebec; Waterloo, Ontario; Morden, Manitoba; Lethbridge, Alberta and Medicine Hat, Alberta. The producers were recruited randomly from the databases used for the larger quantitative research. All producers maintain an annual farm income over $10,000 and fit into one of the five farm types. Every focus group contained a mix of farm types except the Lethbridge location which concentrated on beef producers and feedlots. In every location, ten producers participated in each focus group. (See the summary in Section 7.)

# Section 2: Description of producers

In Section 2, the producers are described by their socio-demographic profile and their farm status. The producer profile was drawn from the survey questions about farm type, the education of producers, their age and their years as main/joint decision makers. Three questions were used to determine producers' farm status: plan for farm operation over the next five years, plan for retirement or to quit farming over the next five years, and classification of farm operation.

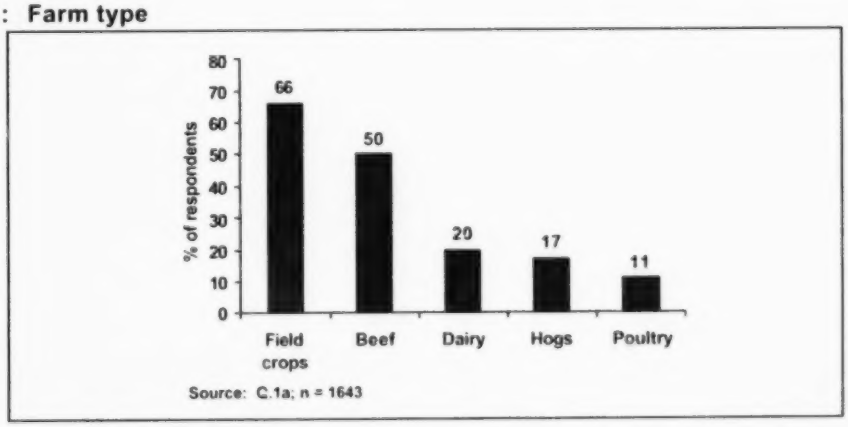
## 2.1 Producer profile

### Farm type

In the survey, producers operated farms producing field crops (66%), beef (50%), milk (20%), hogs (17%) and poultry (11%) (Figure 1).

Field crop and beef producers were concentrated in Alberta, Saskatchewan, Manitoba, and Ontario while milk, hog and poultry producers were more concentrated in Ontario and Quebec.

**Figure 1: Farm type**




Note: Q. is the question number in the survey questionnaire in Appendix B.
n is the number of producers responding to the question.

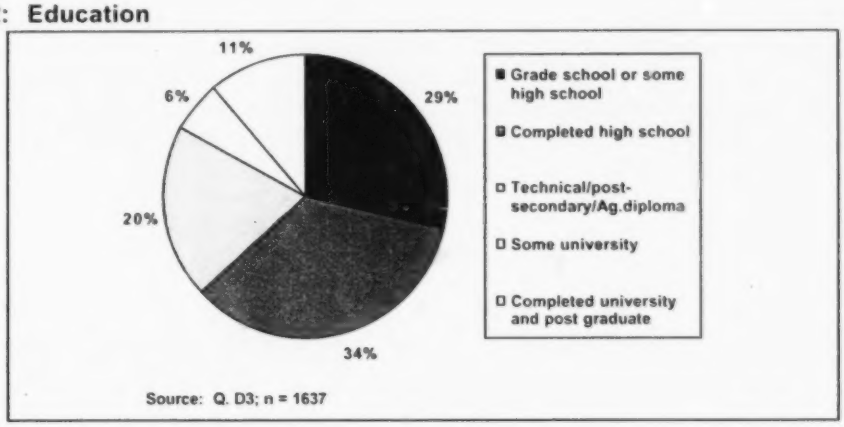
### Education

Almost a third of producers have completed grade school or some high school (29%), while another third have completed high school (34%). Four out of ten producers have post-secondary studies (technical, university, post-graduate) (Figure 2).

The higher educated producers are more likely . . .

- to have higher farm sales
- to be more exposed to information on important issues in agriculture
- to make more frequent use of the Internet
- to be more familiar with carbon sink/sequestration practices and an emissions trading market.

**Figure 2: Education**




Those producers who do not have a degree or diploma in agriculture tend to have lower farm sales and would rather reduce/maintain their current farm size than expand in the next five years.

### Age

The average age of producers is 52 years (Table 3). Producers younger than 52 years are more likely . . .[1]

- to be located in Quebec
- to operate dairy, poultry and hog farms
- to have higher farm sales
- to be higher educated
- to plan to expand operations in the next five years.

1. Source: Q. D5; n = 1628

### Number of years as main/joint decision maker on the farm operation

The average experience of producers in farming as the main/joint decision maker is 25 years[2] (Table 3). Producers with significantly longer experience are more likely . . .

- to be located in Saskatchewan
- to operate field crop and beef farms
- to operate as sole proprietors
- to have lower education
- to want to reduce the farm operations in the next five years.

2. Source: Q. D2; n = 1637

**Table 3: Producer profile**

| | B.C. | Alta. | Sask. | Man. | Ont. | Que. | Atl. | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % of respondents | | | | |
| **Main farm type** | | | | | | | | |
| Field crops | 29 | 38 | 45 | 46 | 26 | 10 | 17 | 30 |
| Beef | 20 | 41 | 45 | 36 | 23 | 10 | 32 | 29 |
| Dairy | 26 | 9 | 4 | 5 | 20 | 34 | 32 | 18 |
| Hogs | 1 | 7 | 2 | 9 | 19 | 34 | 9 | 14 |
| Poultry | 25 | 4 | 4 | 5 | 12 | 10 | 9 | 9 |
| **Farm sales ($)** | | | | | | | | |
| Less than 50,000 | 33 | 24 | 24 | 30 | 28 | 15 | 38 | 26 |
| 50,000 to 99,999 | 14 | 21 | 24 | 23 | 17 | 12 | 10 | 18 |
| 100,000 to 249,999 | 18 | 33 | 37 | 29 | 33 | 33 | 21 | 31 |
| 250,000 to 499,999 | 16 | 11 | 8 | 11 | 10 | 20 | 18 | 13 |
| 500,000 and over | 18 | 11 | 8 | 6 | 12 | 20 | 12 | 12 |
| Not stated (n = 112) | | | | | | | | |
| **Education** | | | | | | | | |
| Grade school or some high school | 22 | 24 | 34 | 33 | 31 | 29 | 27 | 29 |
| Complete high school | 38 | 35 | 34 | 32 | 32 | 38 | 31 | 34 |
| Tech./post secondary, including ag. diploma | 20 | 21 | 15 | 16 | 20 | 25 | 19 | 20 |
| Some university | 7 | 8 | 9 | 5 | 4 | 2 | 8 | 6 |
| Complete university | 10 | 11 | 7 | 13 | 10 | 5 | 15 | 9 |
| Post graduate degree | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| Not stated (n = 6) | | | | | | | | |
| **Age** | | | | | | | | |
| 18 to 34 | 5 | 7 | 3 | 5 | 7 | 10 | 6 | 7 |
| 35 to 44 | 20 | 22 | 20 | 24 | 18 | 27 | 15 | 21 |
| 45 to 54 | 29 | 29 | 27 | 34 | 30 | 35 | 34 | 31 |
| 55 to 64 | 24 | 25 | 32 | 23 | 27 | 23 | 31 | 26 |
| 65 and over | 21 | 17 | 18 | 14 | 18 | 5 | 15 | 15 |
| Mean age in years | 53 | 52 | 54 | 52 | 53 | 48 | 53 | 52 |
| Not stated (n = 15) | | | | | | | | |
| **Number of years as main/joint decision maker on the farm operation** | | | | | | | | |
| Less than 5 | 6 | 5 | 3 | 4 | 5 | 9 | 5 | 5 |
| 5 to 9 | 5 | 4 | 2 | 7 | 5 | 9 | 1 | 5 |
| 10 to 19 | 20 | 21 | 13 | 18 | 16 | 28 | 13 | 19 |
| 20 to 29 | 37 | 30 | 33 | 34 | 31 | 29 | 40 | 32 |
| 30 and over | 32 | 40 | 49 | 37 | 43 | 26 | 41 | 39 |
| Mean number of years | 24 | 26 | 29 | 25 | 26 | 20 | 26 | 25 |
| Not stated (n = 6) | | | | | | | | |

## 2.2 Farm status

### Plan for farm operation over next five years

Half of the producers (50%) do not plan any changes in their current farm business, over a quarter (29%) expect to expand their operations, while 21% plan to reduce their operations in the next five years[3] (Table 4).

Quebec has the highest proportion of producers who plan to expand their farm operations in the next five years (39%) while producers in Ontario are the least likely to expand (21%).

Most keen to expand are poultry producers (40%), milk producers (34%) and hog producers (34%). A higher proportion of field crop producers (26%) and beef producers (26%) are considering reducing their farm activities.

Over half of the producers (54%) with annual gross farm sales of $500,000 and over plan to expand their operations in the next five years compared with only 24% for producers with sales between $50,000 and $99,999.

A higher proportion of producers who are considering expanding their operations have a formal environmental farm management plan for their farm (31% versus 22% for those maintaining and 14% for those reducing).

### Plan for retirement or to quit farming over the next five years

Seven out of ten producers (71%) intend to continue to operate their farms. However, 29% plan to retire or to quit farming in the next five years[4] (Table 4).

Producers in the Atlantic provinces (36%) and Saskatchewan (34%) are more inclined to plan to retire or to quit farming. Quebec (80%) and Alberta (74%) have the highest percentage of producers who plan to stay in agriculture over the next five years. Milk producers (22%) and hog producers (24%) are less likely to plan to retire or to quit farming.

Currently, producers who would be retiring or quitting . . .

- have lower farm sales
- have lower education.

### Ownership of farm operations

More than half the farms are operated as sole proprietorships (54%) while 26% are partnerships and 17% are corporations[5] (Table 4).

Field crop and beef farms tend to be operated more as sole proprietorships whereas poultry farms are more likely to be operated as corporations.

Sole proprietorships tend to operate significantly more in Saskatchewan and Manitoba while corporations are more likely in Quebec. Partnerships are equally likely in any province.

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3. Source: Q. D7; n = 1586
4. Source: Q. D8; n = 1548
5. Source: Q. D1; n = 1643

Corporations are more likely . . .

- to have a formal environmental farm management plan
- to expand in the next five years
- to be run by more highly educated producers
- to be among the first to introduce new technologies.

Sole proprietorships are less likely . . .

- to have a formal environmental farm management plan
- to expand their current operations in the next five years
- to continue farming.

**Table 4: Farm status**

| | B.C | Alta. | Sask. | Man. | Ont. | Que. | Atl. | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % of respondents | | | | |
| **Plan for farm operation over the next five years** | | | | | | | | |
| **Expand** | 35 | 30 | 27 | 29 | 21 | 39 | 28 | 29 |
| **Maintain** | 47 | 48 | 51 | 46 | 53 | 53 | 46 | 50 |
| **Reduce** | 18 | 23 | 22 | 25 | 25 | 8 | 25 | 21 |
| **Don't know (n = 57)** | | | | | | | | |
| **Plan for retirement or to quit farming over the next five years** | | | | | | | | |
| **Yes** | 31 | 26 | 34 | 31 | 30 | 20 | 36 | 29 |
| **No** | 69 | 74 | 66 | 69 | 70 | 80 | 64 | 71 |
| **Don't know (n = 95)** | | | | | | | | |
| **Ownership of farm operations** | | | | | | | | |
| **Sole proprietorship** | 41 | 55 | 62 | 67 | 52 | 44 | 55 | 54 |
| **Partnership** | 32 | 24 | 29 | 23 | 28 | 28 | 19 | 26 |
| **Corporation** | 19 | 17 | 6 | 7 | 18 | 27 | 23 | 17 |
| **Other** | 9 | 4 | 3 | 3 | 2 | 2 | 3 | 3 |

# Section 3: Exposure to agricultural and environmental information

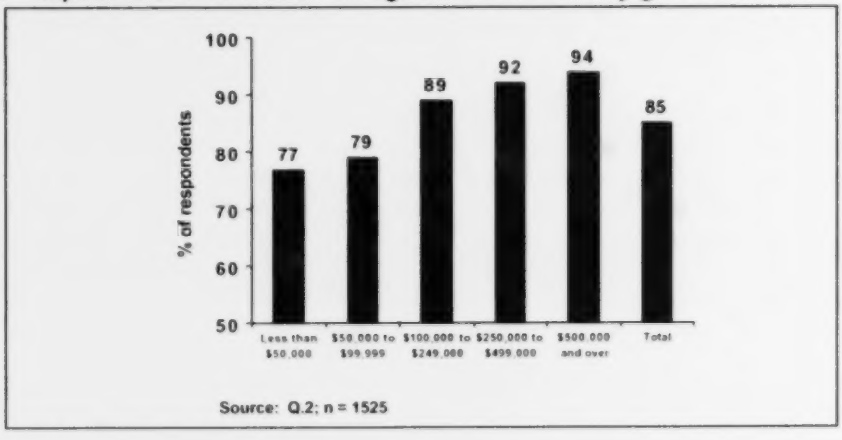
To determine their exposure to agricultural and environmental information, producers were asked about agricultural issues, their sources of information, information received about GHG emissions and climate change and their interest in receiving information on GHG from the government.

## 3.1 Agricultural issues

A majority of producers (85%) read/saw/heard information on issues relevant to their operations. Exposure to agricultural information is similar across the provinces and the farm types.

However, some differences emerge as farm sales increase. Almost all producers (94%) with annual gross farm sales of $500,000 and over state they have been exposed to agricultural information compared with 77% for producers with annual gross farm sales of less than $50,000 (Figure 3).

**Figure 3: Exposure to information on agricultural issues by gross farm sales**




Source: Q.2; n = 1525

The more producers are exposed to information on issues of importance to agriculture, the more likely they are . . .

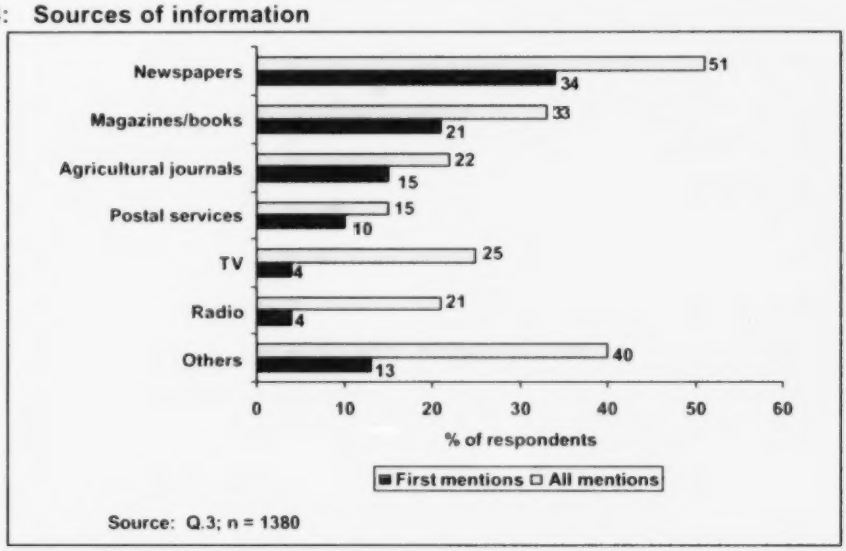
- to expand their operations within the next five years
- to be more familiar with carbon sink/sequestration practices.

## 3.2 Sources of information

### Media

As shown in Figure 4, printed materials (newspapers in particular, followed by magazines/books, agricultural journals and postal services such as mailed brochures) represent the main sources of information compared with television and radio.

**Figure 4: Sources of information**




### Organizations that provide agricultural information

Producers were asked who was responsible for the agricultural information they had received.[6] The most frequent mentions were producer associations (77%), government (49%), industry (47%), extension services (40%) and financial institutions (29%).

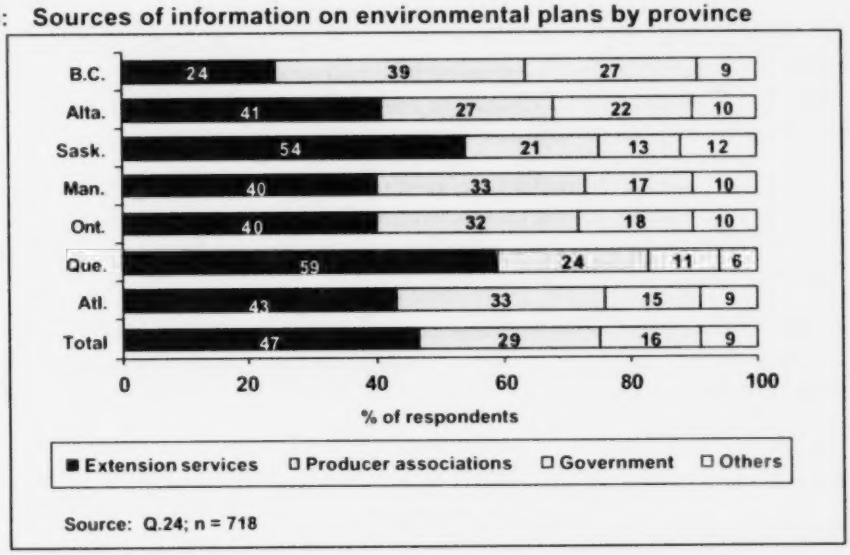
Producer associations are the primary source of agricultural information in Ontario (81%) and Manitoba (80%) while extension services are used mostly in Quebec (57%) and the government is used mostly in Saskatchewan (62%). Poultry producers (84%) and hog producers (81%) make the most use of producer associations. Field crop producers use industry (56%) and the government (55%) as their primary sources of information. Beef producers (48%) and milk producers (46%) favor the government as their second information source after producer associations (75%).

6. Source: Q.3a; n = 1342

Producers were asked which sources they would expect to be the best for information on environmental plans. Of the five sources, extension services were most often selected (47%), followed by producer associations (29%) and the government (16%).

In all provinces except British Columbia, the producers' first choice as sources of information for environmental plans are extension services. Producers in British Columbia consider producer associations (39%) and the government (27%) as their best sources of information for environmental farm plans (Figure 5).

**Figure 5: Sources of information on environmental plans by province**




### Internet

Exposure to the Internet is significant with 45% of producers connected and about 39% use it at least weekly while 41% use it daily.[7] However, only 13% of those connected to the Internet mention it as a means of receiving agricultural information.[8]

Producers that are connected to the Internet are more likely . . .

- to be found in the higher farm income categories (68% of producers with income of $250,000 and over are connected to the Internet versus 38% of producers with income below $250,000)
- to expand the farm in next five years (58% of producers who are connected to the Internet want to expand versus 42% for those not connected)
- to operate as corporations (67% of corporations are connected compared with 44% of partnerships and 38% of sole proprietorship)
- to have a higher level of formal education (64% of producers with a university degree are connected versus 25% for producers that did not complete high school).

7. Source: Q.4a; n = 1643, Q.4b; n = 722
8. Source: Q.3 (All mentions); n = 1380

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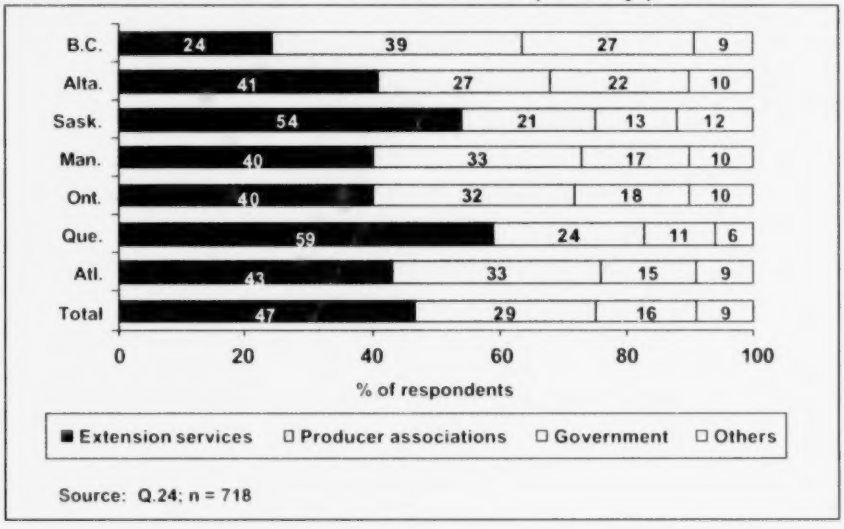


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7. Source: Q.4a; n = 1643, Q.4b; n = 722
8. Source: Q.3 (All mentions); n = 1380

## 3.3 Greenhouse gas emissions and climate change

Compared with the general exposure to agricultural issues, exposure to environmental information is low – 76% of producers have not recently received any information on GHG emissions or climate change.[9]

Producers who had received information on GHG emissions or climate change gave less importance to the impact of agriculture production on climate change – 43% considered the impact very important or moderately important compared with 55% for those who had not received information.

Producers who had received information on GHG emissions or climate change did not have a higher willingness to reduce GHG emissions either voluntarily or with the help from the government compared with those who had not received any information.

Thirty-four percent of producers that had received information on GHG emissions or climate change were familiar with carbon sink/sequestration practices compared with 11% for those that had not received information. They were also more familiar with an emissions trading market (32% versus 11%).

Corporations (31%) and farms with higher farm sales (34% – $500,000 and over) are more exposed to information regarding GHG emissions or climate change than sole proprietorships and partnerships (22%) and those with lower farm sales (25% – $50,000 and less).

## 3.4 Interest in receiving information from the government

Seven out of ten producers (70%) are interested in receiving factual information on GHG emissions from the government.[10]

Three groups are more interested in receiving information from the government:

- producers in Quebec (82%) and the Atlantic provinces (77%)
- producers who want to expand their farm operation (77%)
- producers with farm sales of $250,000 and over (76% and over).

Producers who stated they would be interested in receiving factual information on GHG emissions from the government are more likely to reduce GHG emissions voluntarily (38% versus 19% for those not interested) as well as to consider a formal environmental plan for their farm (23% versus 12%).

9. Source: Q.39; n = 1619
10. Source: Q.40; n = 1623

## 3.5 Interest in attending seminars or training courses

More than half of producers are interested in attending training courses on farming practices to help reduce GHG emissions. Producers who expressed a higher interest are:

- those who plan to expand their farm operation (66%)
- those with gross farm revenue of $100,000 and over (57% to 62%)
- those who have completed post secondary (61%) and university studies (58%)

Producers interested in seminars or training courses on farming practices to help reduce GHG are also more likely to reduce GHG voluntarily (45% vs 20% for those not interested).

# Section 4: Farm business management practices

Producers were asked the frequency of use of some farm business management practices. Four management practices were used at least once a year:

- hiring custom services (60%)
- making use of agriculture resource people (57%)
- attending seminars or taking training courses or home study courses (41%)
- locking in prices for commodities that they produced (34%)

Producers were also asked if they agreed or disagreed with some statements related to farm business management practices. Producers strongly agreed or agreed to four statements:

- managing risks associated with uncertainty is the producers' responsibility (60%)
- reinvesting in the farm makes more sense than making non-farm investments (51%)
- plan to make important changes in the way they market the commodities they produce (33%)
- always the first one in their area to try a new technology or new products (27%)

In this section, we consider each of these eight bullets regarding farm business management practices.

## 4.1 Hired custom services

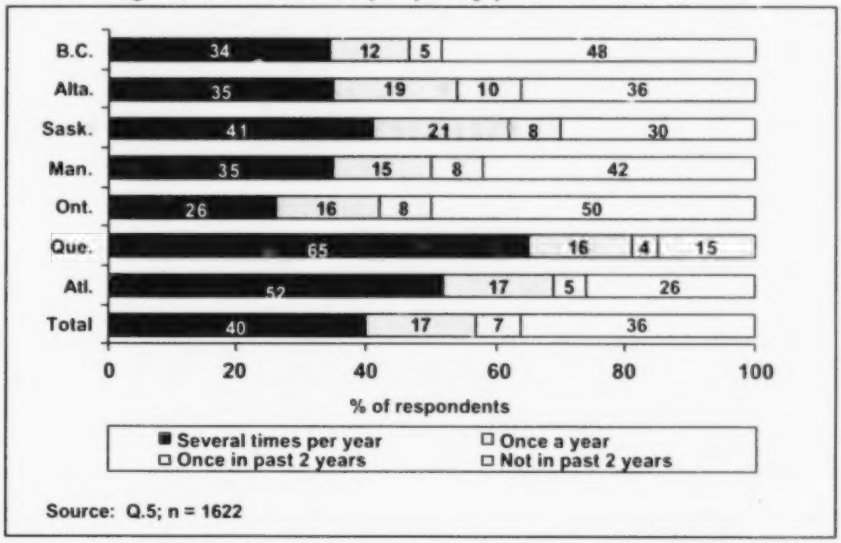
The practice of hiring custom services is most commonly used in Alberta (66%), Quebec (65%), Ontario (64%) and Manitoba (62%).[11] Producers in the Atlantic provinces are less inclined to use these services – 60% said they have not used them on their farm in the last two years. Milk producers are more likely to use hired custom services (71%).

11. Source: Q.5; n = 1635

## 4.2 Making use of agriculture resource people

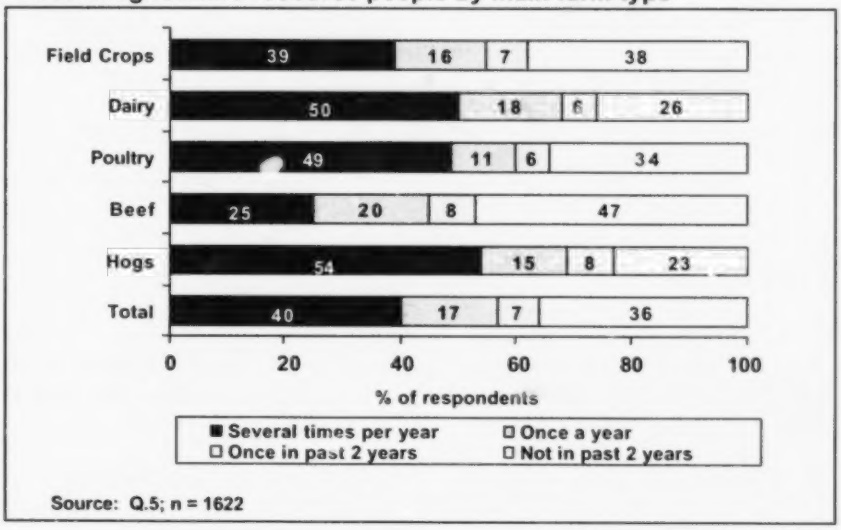
Producers in Quebec (81%) and the Atlantic provinces (69%) are more likely to make use of agriculture resource people at least once a year. Half (50%) of Ontario producers and 48% of British Columbia producers have not used this management practice in the past two years (Figure 6).

**Figure 6: Use of agriculture resource people by province**




Almost seven out of ten milk producers (68%) and hog producers (69%) say they regularly use agricultural resource people compared with more than half of the beef producers (55%) who have not used this management practice in the last two years or only once in the past two years (Figure 7).

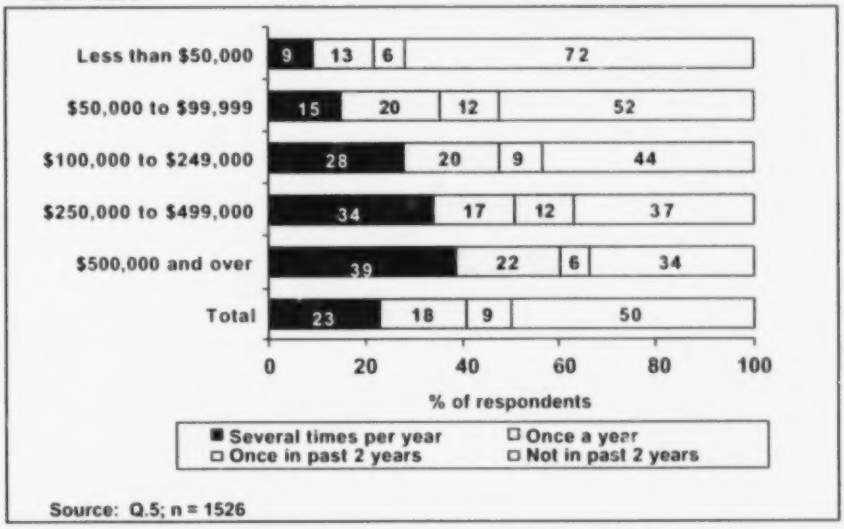
**Figure 7: Use of agriculture resource people by main farm type**



## 4.3 Attending seminars, training courses or home study courses

Poultry producers are more likely to attend seminars and take training courses or home study courses. Half of them (51%) made use of this management practice at least once a year compared with only 29% of beef producers. Producers with farm sales of $500,000 and over (61%) are more likely to attend seminars or to take training courses at least once a year compared with producers with farm sales below $50,000 (22%) (Figure 8).

**Figure 8: Attendance at seminars/training courses/home study courses by gross farm sales**




Producers who attended seminars and took training courses or home study courses at least once in the past two years are more inclined to be very interested in programs to help them develop an environmental plan for their farm (26% versus 15%). They are generally also more familiar with an emissions trading market (22% versus 10%) and with carbon sink/sequestration practices (24% versus 8%) compared with those who did not attend seminars/took courses. Consequently, they are more interested in attending seminars or in taking training courses on farming practices to reduce GHG emissions (65% versus 39%) compared with those not attending seminars/courses in the past two years.

## 4.4 Locking in prices for commodities produced

Almost half the producers in Quebec (46%) and Saskatchewan (43%) claim to lock in prices at least once a year for the commodities they produce.[12] Producers in the Atlantic provinces (76%) and British Columbia (72%) have not used this management practice in the last two years. Field crop producers (46%) are more likely to lock in prices than other producers.

12. Source: Q.5; n = 1578

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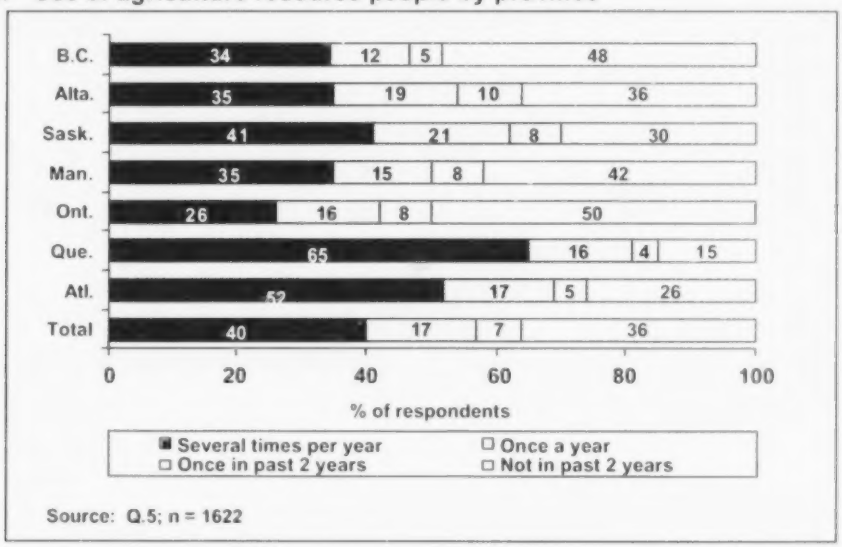


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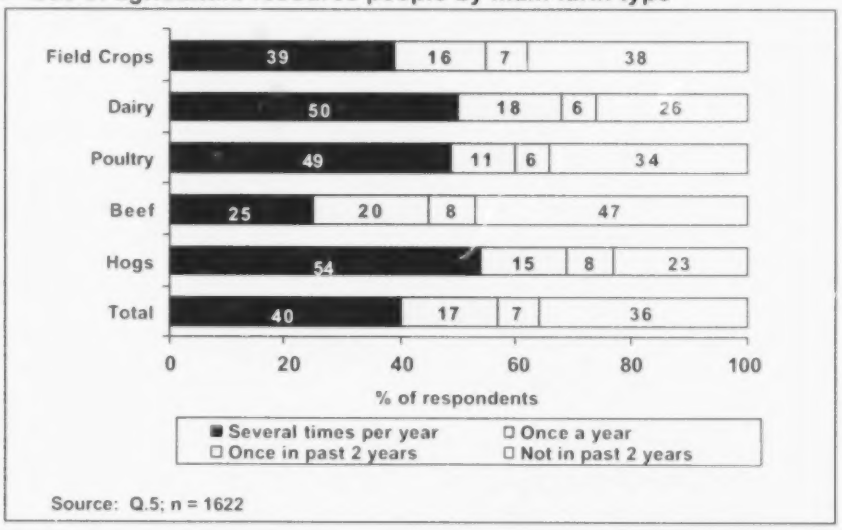

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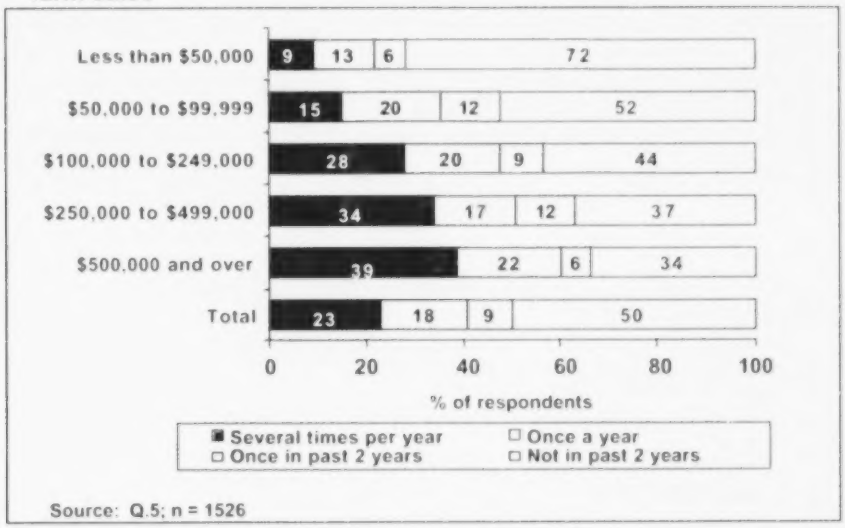


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12 Source: Q.5; n = 1578

## 4.5 The responsibility of managing risk

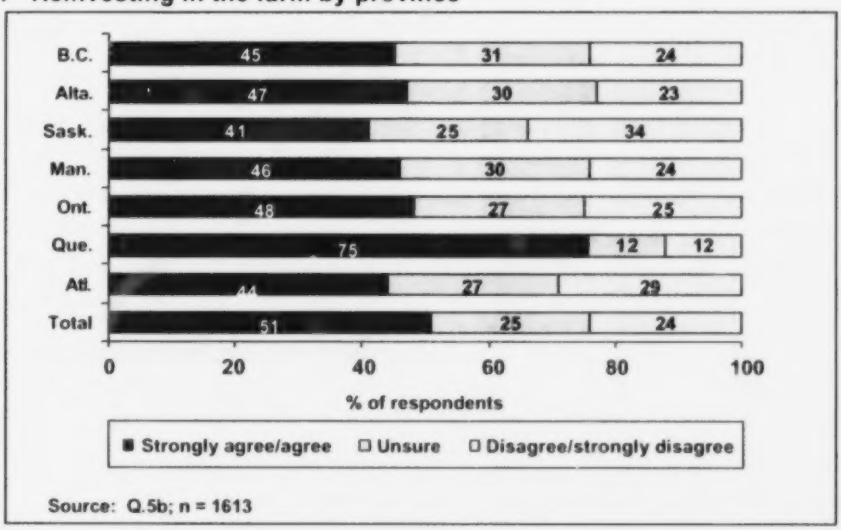
Producers in Manitoba (69%), British Columbia (67%), Saskatchewan (65%) and Alberta (64%) agree that managing risk associated with market uncertainty is their responsibility.[13] Producers in Quebec (47%) are less inclined to agree. Many field crop producers agree (65%) but only half the hog producers (51%) agree that managing risk is their responsibility.

## 4.6 Reinvesting in the farm versus non-farm investments

Seven out of ten producers (75%) in Quebec agree[14] that it makes more sense to reinvest in their farm operations than making non-farm investments (Figure 9). Fewer than five out of ten producers (about 45%) agree in the other provinces. Three out of ten producers in Saskatchewan disagree[15] (34%).

Milk producers (67%) and poultry producers (59%) are more likely to agree that it makes more sense to reinvest in their farm operations compared with field crop producers (40%) or beef producers (48%). Producers with farm sales of $500,000 and over are also more likely to agree (59%) that reinvesting in their farms makes more sense than making non-farm investments.

**Figure 9: Reinvesting in the farm by province**




13. Source: Q.5b; n= 1597
14. Agree plus strongly agree
15. Disagree plus strongly disagree

## 4.7 Plan to make important changes in their marketing

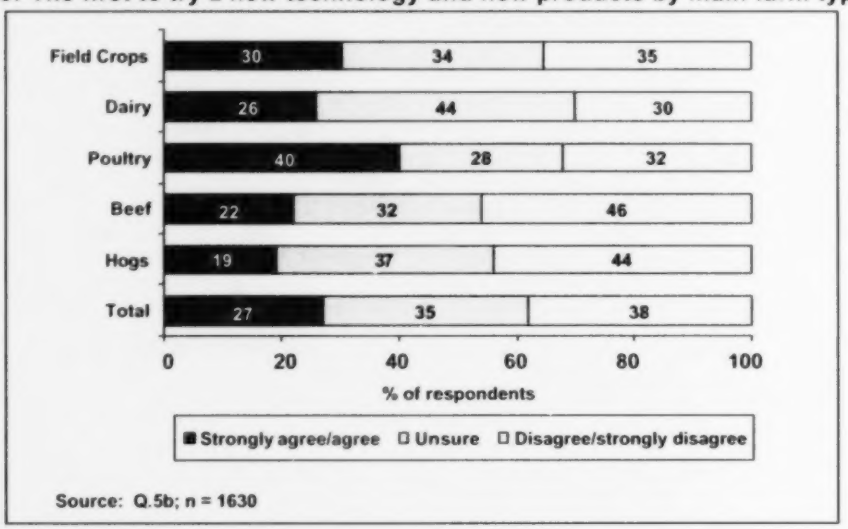
A third of producers (33%) strongly agree or agree that they plan to make important changes in the way they market the commodities that they produce.[16]

Producers in Alberta (39%) and Manitoba (37%) had the highest proportion of producers who expect to make important changes in the way they market the commodities they produce. Producers in British Columbia (49%) and Quebec (48%) are less inclined to make changes as a larger percentage of them disagree or strongly disagree with this statement.

## 4.8 The first to try a new technology and new products

Poultry producers (40%) and field crop producers (30%) are the most likely to be the first to try a new technology and new products while hog producers and beef producers are the least likely as respectively 44% and 46% disagreed or strongly disagreed with the statement (Figure 10).

**Figure 10: The first to try a new technology and new products by main farm type**




16. Source: Q.5b; n = 1594

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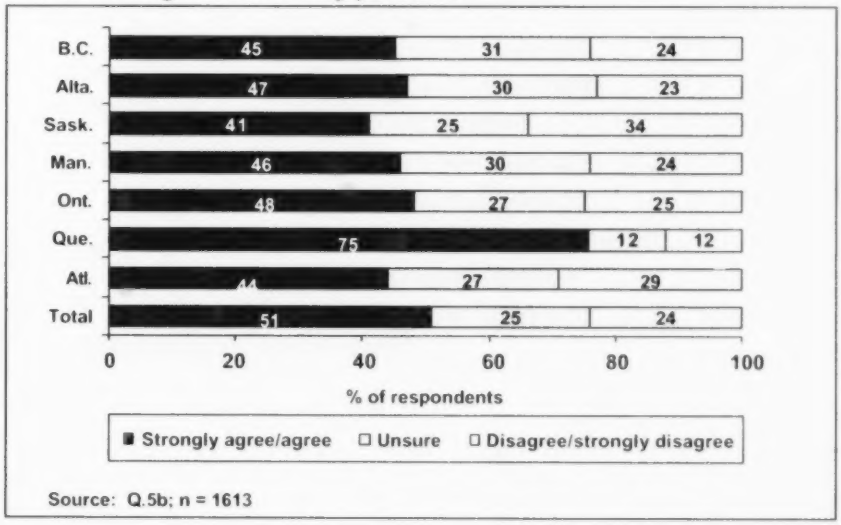


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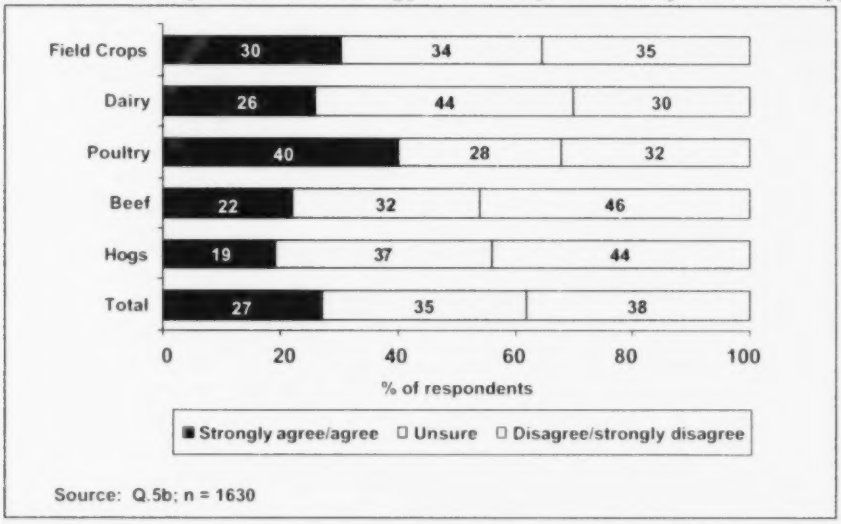



16. Source: Q.5b; n = 1594

# Section 5: Awareness and familiarity with climate change and greenhouse gas issues

To evaluate producers' awareness and familiarity with climate change and GHG issues, the survey questioned the producers about six areas:

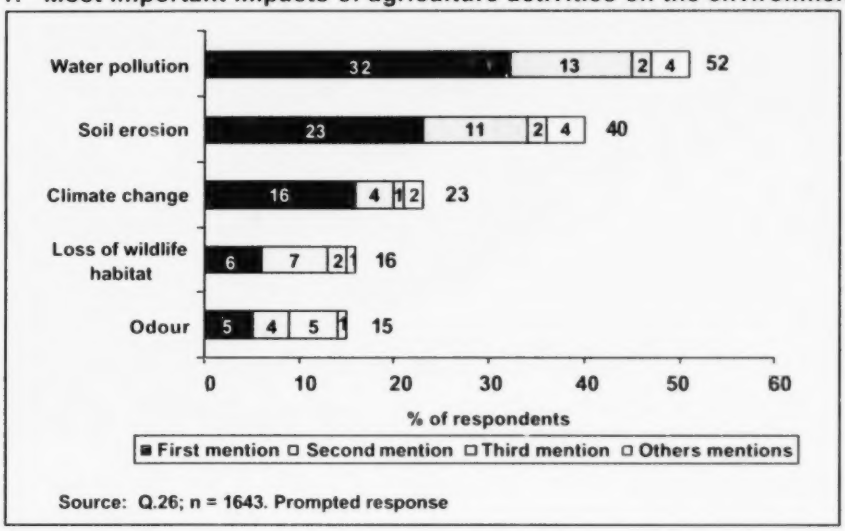
- the impact of agriculture on the environment
- the future impact of climate change on agriculture
- their awareness of climate change and GHG issues
- their awareness of the impact of farming practices on climate change
- their familiarity with carbon sink/sequestration practices and an emissions trading market
- their perception of climate change.

## 5.1 The impact of agriculture on the environment

Producers view water pollution and soil erosion as the two most important impacts of agricultural activities on the environment (Figure 11). Only 23% of producers (all mentions) selected climate change as an impact of agricultural activities:

- water pollution (52%)
- soil erosion (40%)
- climate change (23%)
- loss of wildlife habitat (16%)
- odour (15%).

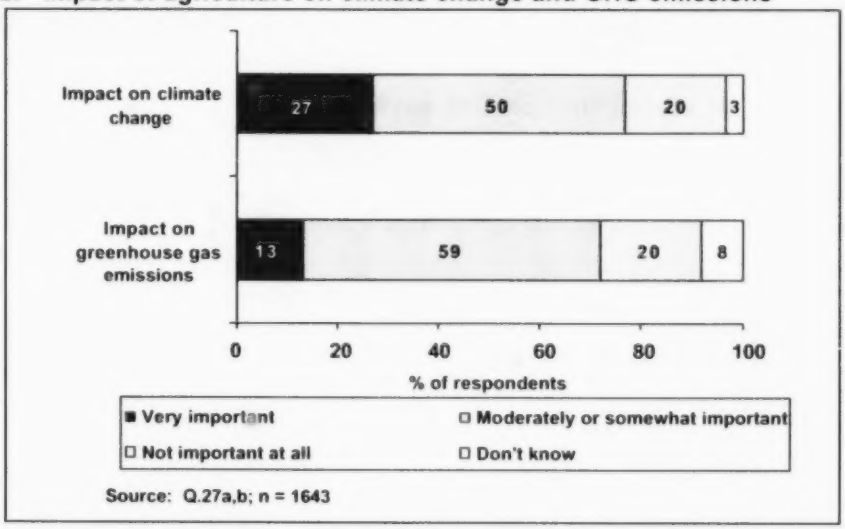
**Figure 11: Most important impacts of agriculture activities on the environment**




Producers attach somewhat more importance to the impact of agricultural activities on climate change relative to agricultural activities on GHG emissions (27% say climate change is very important compared with 13% for GHG emissions). Surprisingly, 20% of producers say that the impact of agriculture on climate change or on GHG emissions is not important at all. However, a majority of producers tend to find the impact of agriculture on climate change (50%) or on GHG emissions (59%) as moderately or somewhat important (Figure 12).

Ontario has the highest percentage of producers who consider that agricultural activities have a very important impact on climate change (33%) and GHG emissions (17%). This result contrasts with British Columbia where producers are more inclined to mention that the impact is not at all important (30% on climate change and 27% on GHG emissions).

**Figure 12: Impact of agriculture on climate change and GHG emissions**



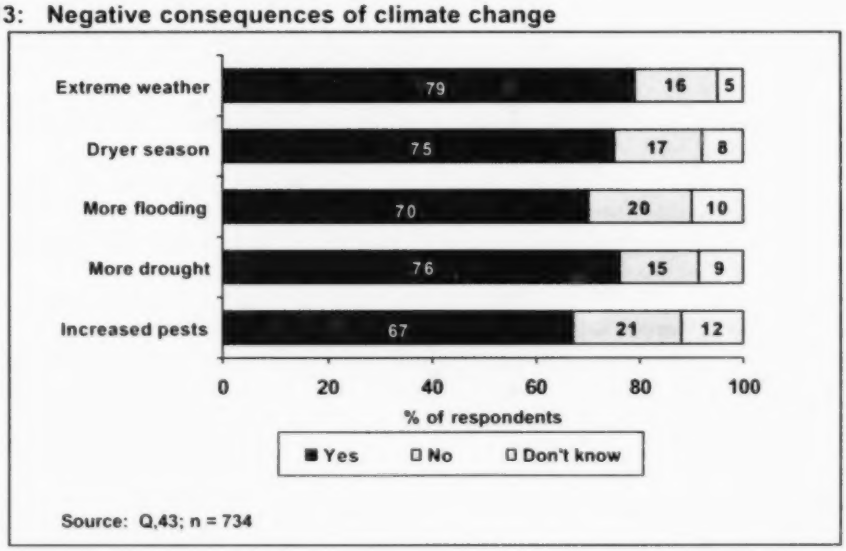
## 5.2 The future impact of climate change on agriculture

Producers were asked "What do you think the impact of climate change will be on Canadian agriculture?"[17] Clearly there is no consensus among producers on the future impact of climate change. More than half of the producers believe that climate change will have an impact with 30% expecting a positive impact and 26% a negative impact. However, a large proportion of producers (34%) believe there will be no impact. Producers who consider that climate change will have an impact on Canadian agriculture, either positive or negative (20%), are more inclined to be very interested to voluntarily reduce GHG emissions on their operation compared with those who think there will be no impact or those who do not know (14%).

Producers in Quebec are more inclined to consider climate change to be positive (47%) compared with the other provinces. Producers with high farm sales ($500,000 and over) (40%) are also more inclined to consider climate change to be positive compared with producers with lower farm sales (29% – $50,000 to $99,999 and 25% less than $50,000).

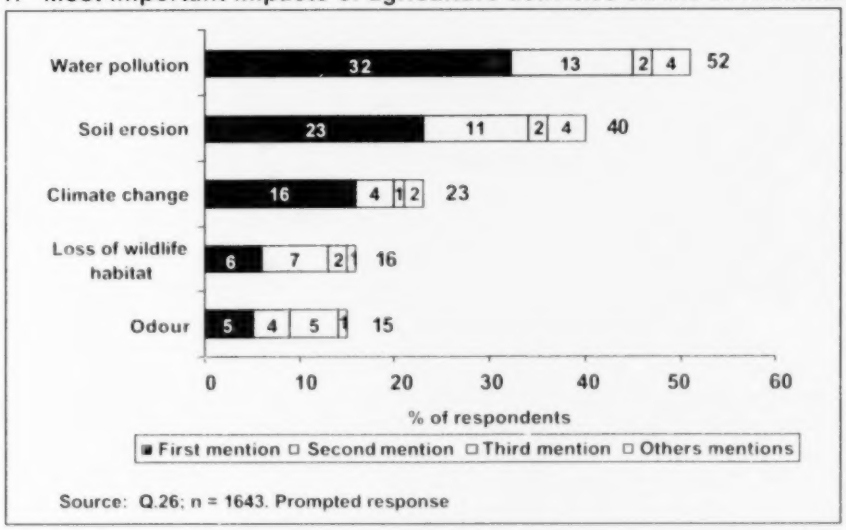
Producers, who believe that climate change will have an impact (either positive or negative) on agriculture, were asked to give their opinion on more specific environmental impacts of climate change related to agricultural activities. A large majority of these producers believe that climate change will result in extreme weather (79%) and more droughts (76%) (Figure 13) but that climate change will also make possible the introduction of new crop varieties (82%) and a longer growing season (72%) (Figure 14).

**Figure 13: Negative consequences of climate change**




17. Source: Q42; n = 1322

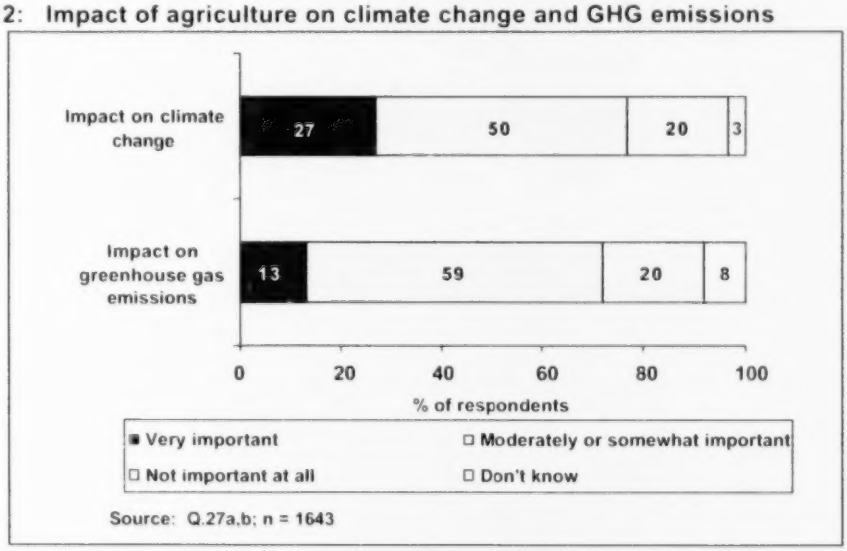
**Figure 11: Most important impacts of agriculture activities on the environment**




Producers attach somewhat more importance to the impact of agricultural activities on climate change relative to agricultural activities on GHG emissions (27% say climate change is very important compared with 13% for GHG emissions). Surprisingly, 20% of producers say that the impact of agriculture on climate change or on GHG emissions is not important at all. However, a majority of producers tend to find the impact of agriculture on climate change (50%) or on GHG emissions (59%) as moderately or somewhat important (Figure 12).

Ontario has the highest percentage of producers who consider that agricultural activities have a very important impact on climate change (33%) and GHG emissions (17%). This result contrasts with British Columbia where producers are more inclined to mention that the impact is not at all important (30% on climate change and 27% on GHG emissions).

**Figure 12: Impact of agriculture on climate change and GHG emissions**



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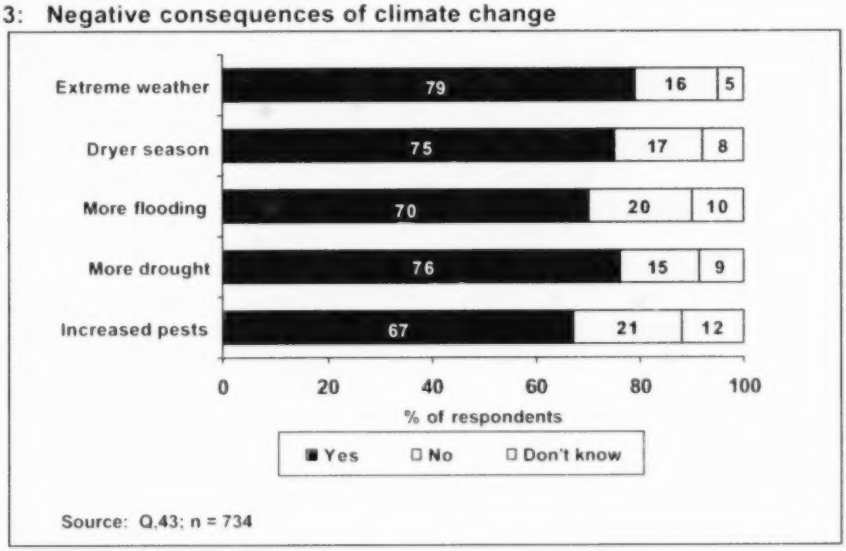
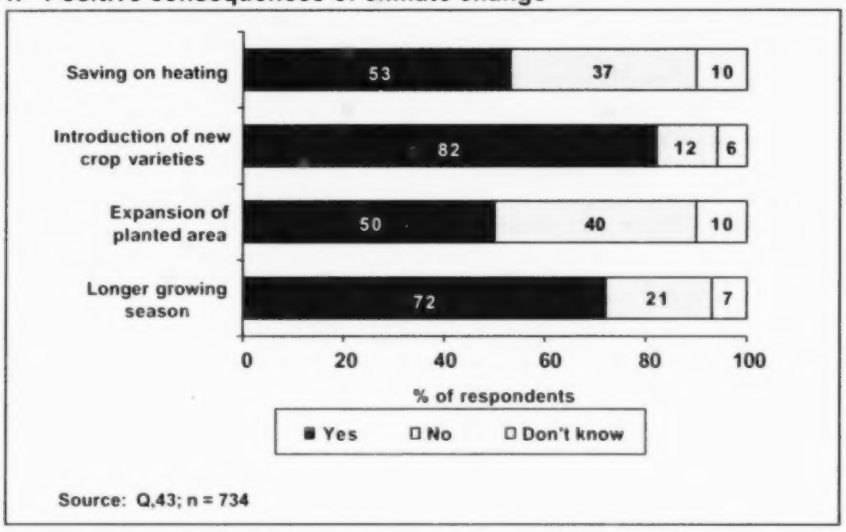
Producers, who believe that climate change will have an impact (either positive or negative) on agriculture, were asked to give their opinion on more specific environmental impacts of climate change related to agricultural activities. A large majority of these producers believe that climate change will result in extreme weather (79%) and more droughts (76%) (Figure 13) but that climate change will also make possible the introduction of new crop varieties (82%) and a longer growing season (72%) (Figure 14).

**Figure 13: Negative consequences of climate change**




17. Source: Q42; n = 1322

**Figure 14: Positive consequences of climate change**




Producers in Saskatchewan think that climate change will help to introduce new crop varieties (94%) while producers in the Atlantic provinces are mostly concerned with extreme weather (92%), more drought (92%) and an increased number of pests (75%).

Beef producers are more inclined to consider the negative impacts of climate change as they foresee dryer seasons (84%). Field crop producers are the most concerned about the negative impacts of extreme weather (85%).

## 5.3 The awareness of climate change and greenhouse gas issues

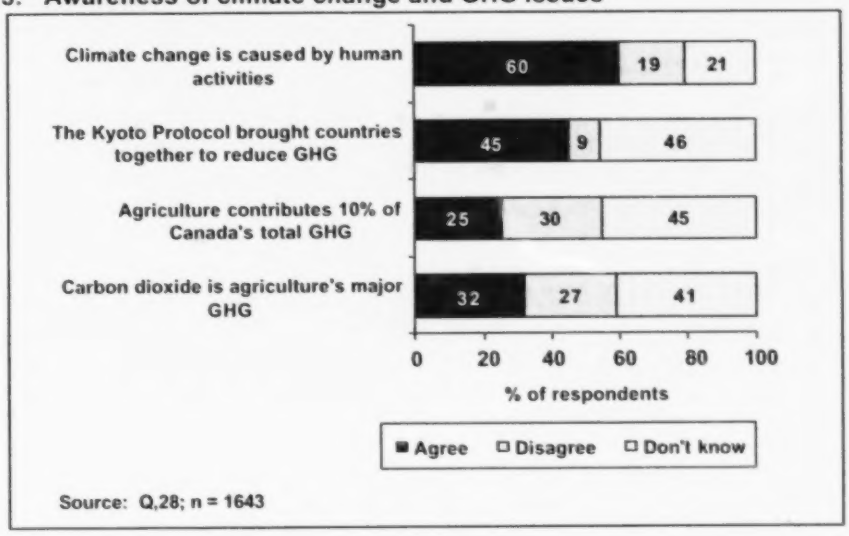
Producers were presented with four statements related to climate change and GHG emissions. They had to indicate if they agreed or disagreed with the statements or did not know. The level of knowledge was generally low for most statements – between 40% and 75% either had the wrong answer or no answer (Figure 15).

There is a relatively high agreement (60%) with the statement that climate change is caused by human activities. While 45% agree that the Kyoto Protocol brought countries together to reduce GHG emissions, another 46% did not know.

However, producers seemed to be less aware of the more specific statements. Producers were not very aware that "agriculture contributes 10% of Canada's total GHG emissions." Only 25% agreed with this statement while 75% either disagreed (30%) or did not know (45%). Carbon dioxide contributes only one percent of total agriculture GHG emissions, yet 32% of producers believe that it is the major GHG in agriculture.

Generally, there are no significant differences between the provinces or the level of farm sales in the producers' level of awareness of these four statements. However by farm type, beef producers generally lag in their level of awareness of climate change and GHG emissions.

**Figure 15: Awareness of climate change and GHG issues**




## 5.4 The awareness of the impact of farming practices on climate change

Producers who find the impact of agricultural production on climate change at least somewhat important were asked about the impact of six farming practices on climate change. For each statement, we present the impact of the farming practice followed by the producers' responses. Between 55% and 84% of producers could not properly identify the impact of the six farming practices on climate change (Figure 16):

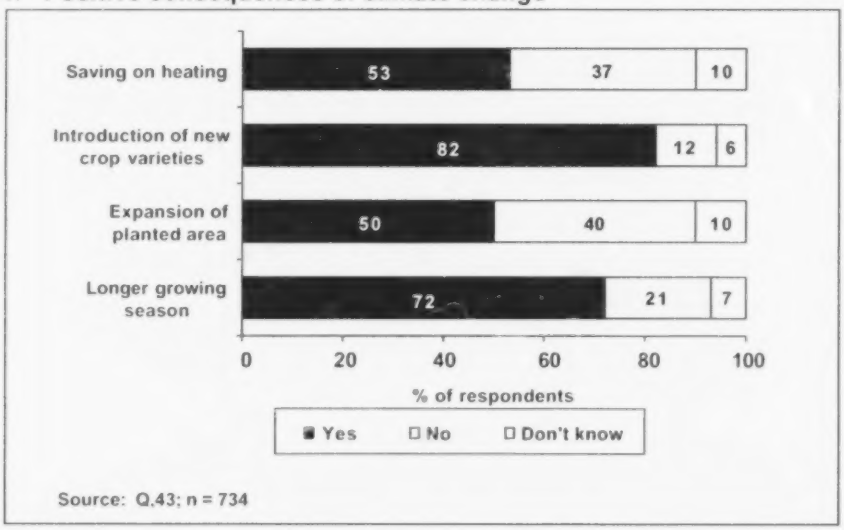
**Using conservation tillage (reduced/zero tillage) *decreases* the impact on climate change:** 41% of producers agree while 30% think it has no impact and 18% actually believe it increases the impact on climate change. Producers in Saskatchewan (49%) and the Atlantic provinces (46%) are the most aware of the benefit of zero tillage on reducing GHG emissions as well as field crop and hog producers (47%).

**Summerfallow *increases* the impact on climate change:** 30% agree while 39% consider it has no impact and 16% say that it actually decreases the impact. The awareness of the negative effects of summerfallow is higher in Saskatchewan (48%), Manitoba (45%) and Alberta (39%) and the lowest in Quebec (9%). Field crops producers (42%) are the most aware of the negative effect of summerfallow, while livestock producers are much less aware, particularly hog producers with only 17% who recognize the negative impact.

**Growing shelter belts *decreases* the impact on climate change:** 45% agree yet 25% still think they increase the impact. Although 52% of Saskatchewan producers consider shelter belts beneficial, again another 27% think they increase the impact on climate change. Field crop and hog producers (50%) are the most aware of the benefit of shelter belts compared with milk producers (38%).

**Allowing free range grazing (intensive grazing system) *increases* the impact on climate change:** 16% agree but 53% of producers think free range grazing has no impact. Producers in Quebec (23%) have the highest awareness level while producers in British

**Figure 14: Positive consequences of climate change**




Source: Q.43; n = 734

Producers in Saskatchewan think that climate change will help to introduce new crop varieties (94%) while producers in the Atlantic provinces are mostly concerned with extreme weather (92%), more drought (92%) and an increased number of pests (75%).

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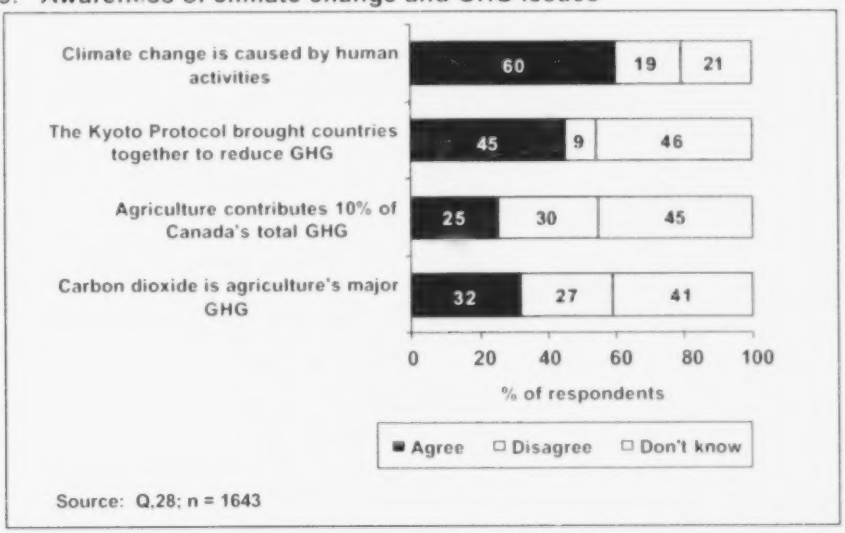
However, producers seemed to be less aware of the more specific statements. Producers were not very aware that "agriculture contributes 10% of Canada's total GHG emissions." Only 25% agreed with this statement while 75% either disagreed (30%) or did not know (45%). Carbon dioxide contributes only one percent of total agriculture GHG emissions, yet 32% of producers believe that it is the major GHG in agriculture.

Generally, there are no significant differences between the provinces or the level of farm sales in the producers' level of awareness of these four statements. However by farm type, beef producers generally lag in their level of awareness of climate change and GHG emissions.

Figure 15: **Awareness of climate change and GHG issues**

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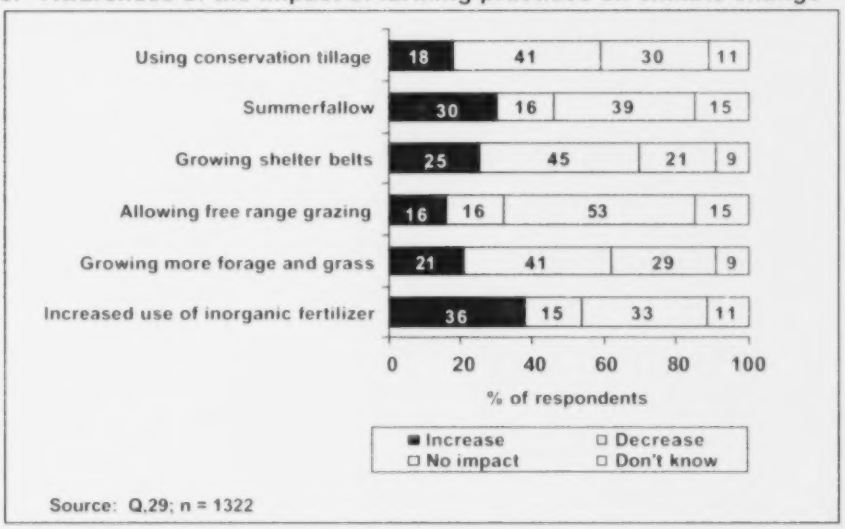
**Allowing free range grazing (intensive grazing system) *increases* the impact on climate change:** 16% agree but 53% of producers think free range grazing has no impact. Producers in Quebec (23%) have the highest awareness level while producers in British

Columbia have the lowest (7%). Although free range grazing concerns mostly beef producers, only 17% consider that it increases the impact on climate change while 56% think there is no impact.

**Growing more forage and grass *decreases* the impact on climate change:** 41% agree but 29% of producers think growing more forage and grass has no impact. More producers in Saskatchewan (52%) consider this practice beneficial in reducing the effect on climate change as well as field crop producers (51%).

**Increased use of inorganic fertilizer *increases* the impact on climate change:** 36% agree yet 15% of producers believe it decreases the impact while 33% consider it has no impact. Producers in the Atlantic provinces (45%) and Quebec (42%) are the most aware of the impact of inorganic fertilizer while field crop producers (18%) and beef producers (17%) have the highest level of producers who believe the increased use of inorganic fertilizer decreases the impact on climate change.

**Figure 16: Awareness of the impact of farming practices on climate change**




## 5.5 The familiarity with farming practices which lead to carbon sequestration or carbon sink and an emissions trading market

Only 16% of producers are familiar with farming practices which lead to carbon sequestration or carbon sink. Producers in Saskatchewan (22%) are the most familiar along with producers in Manitoba (19%) and Ontario (19%). The least likely to be familiar with these practices are producers in provinces with lower grain production such as Quebec (8%) (Figure 17). Not surprisingly, field crop producers (22%) are more familiar with these practices than milk, poultry or beef producers (13% or less).

Higher farm sales suggest higher familiarity since 26% of producers with farm sales of $500,000 and over are familiar with carbon sink/sequestration practices compared with 15% of producers with farm sales of $100,000 and less.

Columbia have the lowest (7%). Although free range grazing concerns mostly beef producers, only 17% consider that it increases the impact on climate change while 56% think there is no impact.

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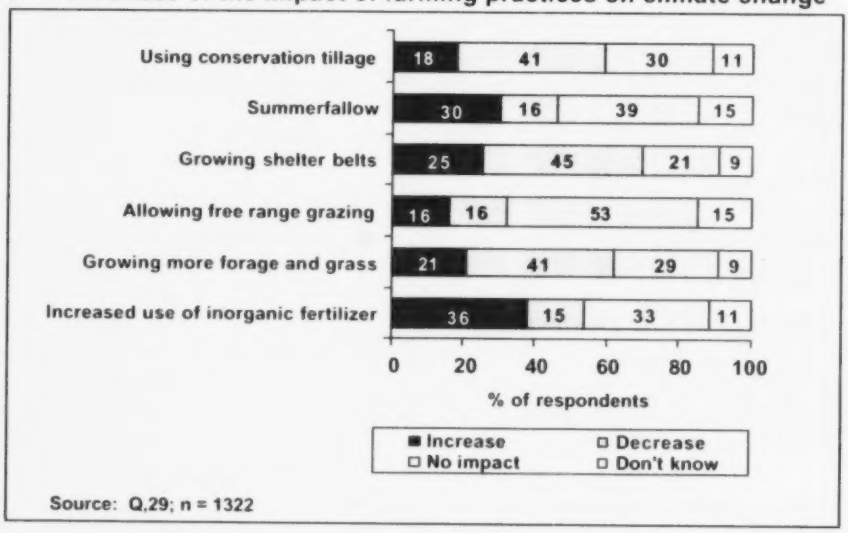


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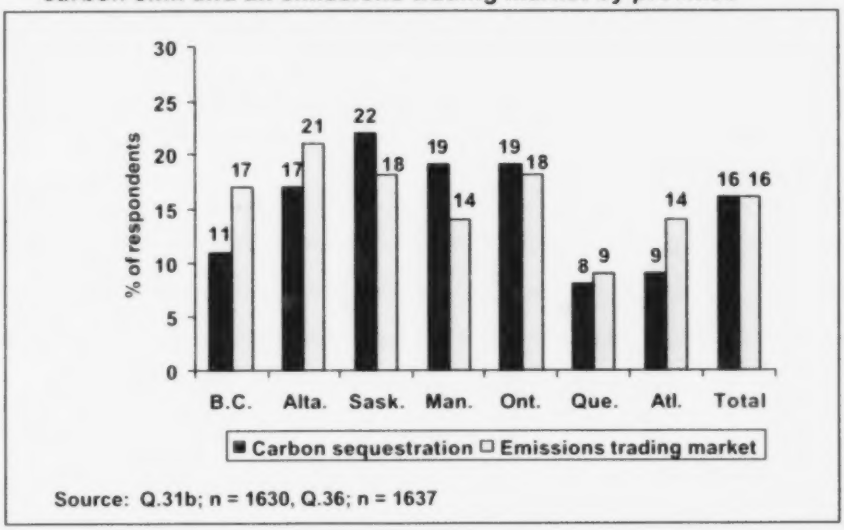
Higher farm sales suggest higher familiarity since 26% of producers with farm sales of $500,000 and over are familiar with carbon sink/sequestration practices compared with 15% of producers with farm sales of $100,000 and less.

The familiarity with an emissions trading market is low – only 16% of producers are familiar with it. Familiarity is higher with producers in Alberta (21%), Saskatchewan (18%) and Ontario (18%) and lowest in Quebec (9%) (Figure 17).

Two out of ten field crop producers (20%) and poultry producers (21%) are familiar with an emissions trading market while beef producers (12%) are the least familiar. Consistent with the familiarity of carbon sink/sequestration practices, producers with gross farm sales of $500,000 and over are more familiar with an emissions trading market (27%) compared with lower revenue farms particularly those with farm sales of $100,000 and less (14%).

**Figure 17: Familiarity with farming practices which lead to carbon sequestration or carbon sink and an emissions trading market by province**




Source: Q.31b; n = 1630, Q.36; n = 1637

## 5.6 Perception of climate change

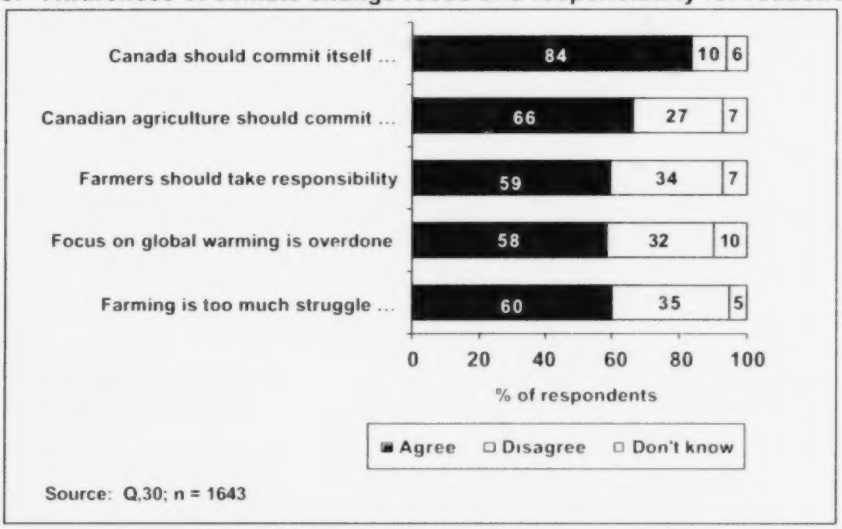
Producers are more inclined to think that Canada as a country should be responsible for reducing GHG emissions (84%) rather than Canadian agriculture (66%) or producers themselves (59%) (Figure 18).

Producers in the Atlantic provinces (68%), Ontario (64%) and Quebec (63%) are more inclined to agree that producers must take responsibility in reducing GHG emissions. Producers in the prairie provinces are less inclined to agree as a higher percentage of producers (about 40%) disagree that they should take responsibility.

The majority of poultry producers (67%) think that producers should take responsibility in reducing GHG emissions.

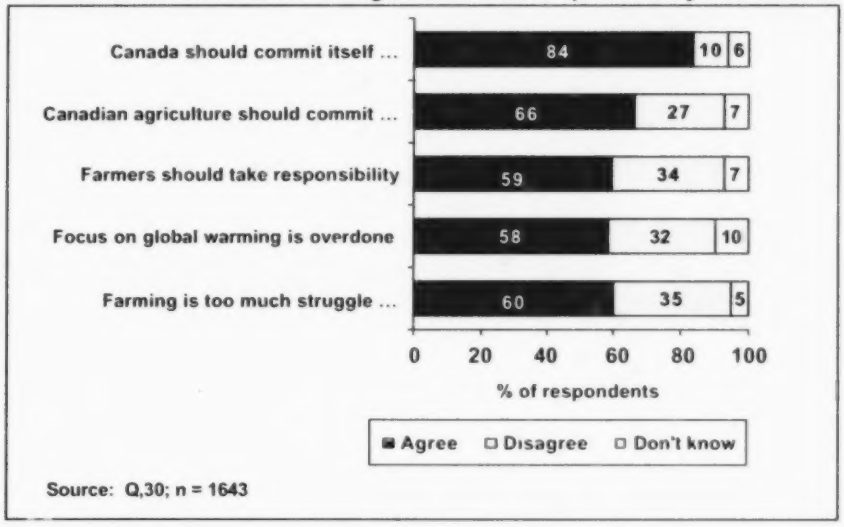
About six out of ten producers (58%) think that the focus on global warming is overdone and (60%) that farming is too much of a struggle to allow climate change issues to be a priority on their farm (Figure 18). Producers in Alberta and Manitoba (both 67%) are more inclined to agree that the focus on global warming is overdone. Producers in the Atlantic provinces tend to disagree (45%) that there is too much focus on global warning.

**Figure 18: Awareness of climate change focus and responsibility for reduction**




Source: Q.30; n = 1643

**Figure 18: Awareness of climate change focus and responsibility for reduction**




Source: Q,30; n = 1643

# Section 6: Producer's behaviour related to GHG emissions

To describe producers' behaviour, this section has six topics:

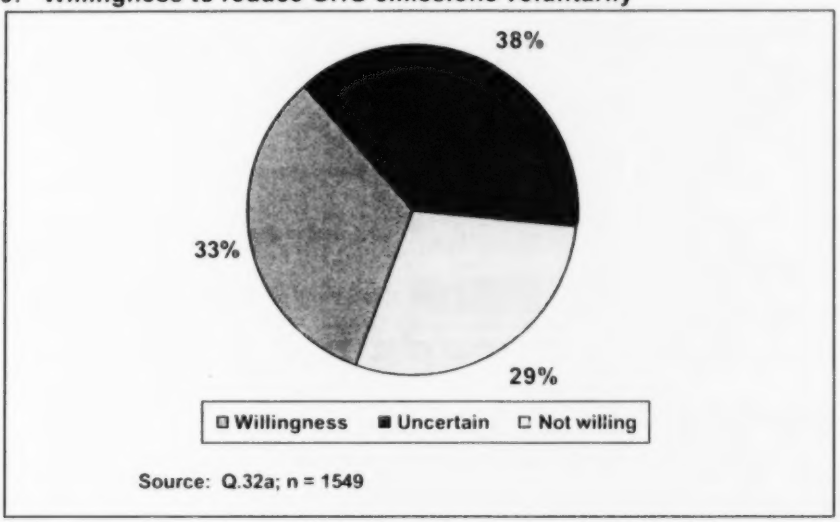
- their willingness to reduce GHG emissions
- the type of government initiatives to help producers reduce GHG emissions
- the farming practices of producers with seeded crop land
- their interest in an emissions trading market
- their manure management practices
- their environmental farm management plan.

## 6.1 Willingness to reduce GHG emissions

To measure their intention to reduce GHG emissions on their farms, producers were asked if they were willing to reduce them voluntarily or with the help of the government. Producers expressed their opinion on a scale of one to five where one meant not at all willing and five meant very willing.

On a voluntary basis, 33% were willing (rating of four and five) while 29% were not willing (rating of one and two) to reduce GHG emissions (Figure 19).

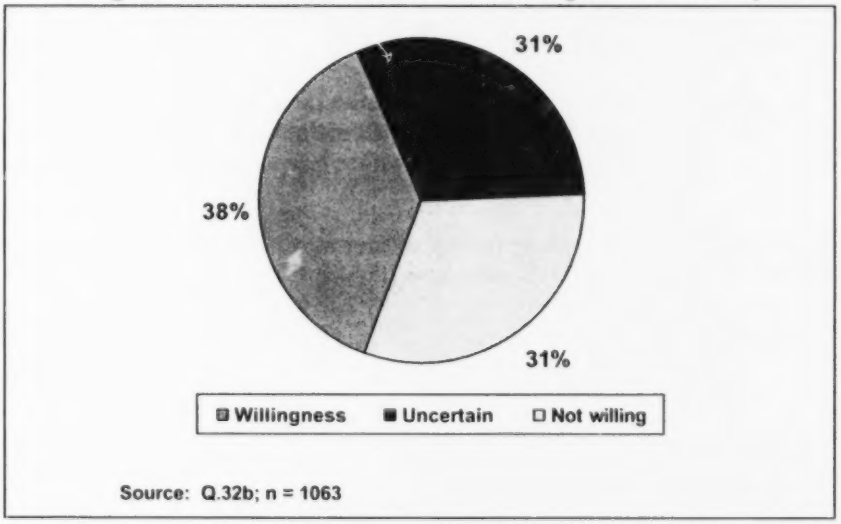
**Figure 19: Willingness to reduce GHG emissions voluntarily**




Producers in the Atlantic provinces (41%) and Ontario (37%) were the most likely to be willing to reduce GHG emissions voluntarily. There were no significant differences in responses between farm types or farm sales.

If they received help from the government, the producers who indicated they were not at all willing, not willing or uncertain (ratings of one, two or three) were asked if they would voluntarily reduce GHG emissions on their farms. With government assistance 38% of those modified their position and became willing (rating of four and five) to reduce GHG emissions (Figure 20).

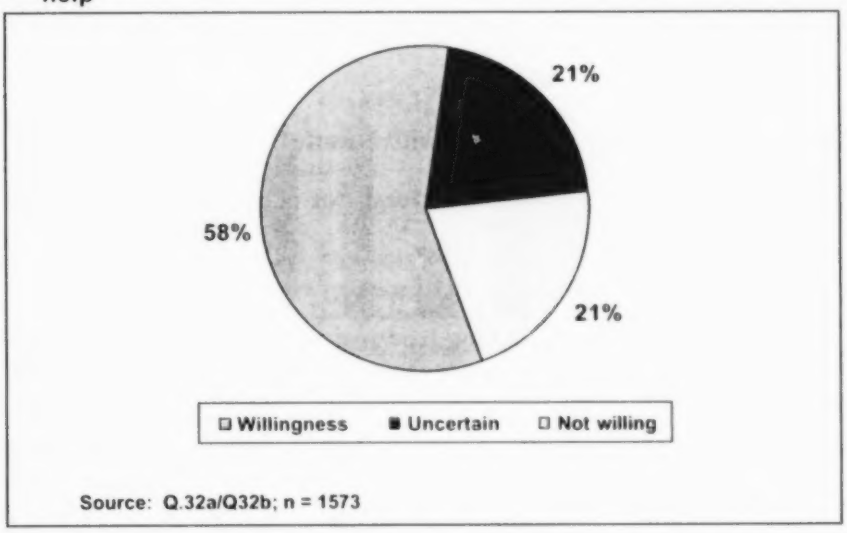
**Figure 20: Willingness to reduce GHG emissions with government help**




Combining the voluntary basis responses with help from the government responses we find that 58% of producers were willing to reduce GHG emissions while those unwilling drops to

21%. The remaining producers (21%) were uncertain of their intent to reduce GHG emissions (Figure 21).

**Figure 21: Willingness to reduce GHG emissions voluntarily and with government help**




## 6.2 Type of government initiatives to help producers reduce GHG emissions

A majority of producers (85%) agree that the government should help producers reduce GHG emissions.[18] When asked what type of help or support the government should give, three types of assistance were mentioned most often:[19]

- financial incentives (50%)
- more information (32%)
- training (15%).

Producers in the Atlantic provinces (62%) and Ontario (58%) are more interested in financial incentives, whereas producers in Quebec are the most interested in information (48%). A higher proportion of producers in the Atlantic provinces would use training (25%) compared with the other provinces.

Producers who acknowledged that agricultural activities have an impact on climate change or GHG emissions were asked to choose between five government initiatives that would most influence them in reducing GHG emissions on their farms. Producers more frequently chose three initiatives:[20]

- technical advice and support in adopting farming practices (30%)

18. Source: Q.31; n = 1241
19. Source: Q.31a (total unaided mentions); n = 1055
20. Source: Q.38; n = 1309

- investment in research on agriculture and GHG emissions (28%)
- voluntary programs (18%).

In contrast, the interest for the two other government initiatives was lower:

- interest in an emissions trading market (10%) and
- new regulations to reduce GHG (5%).

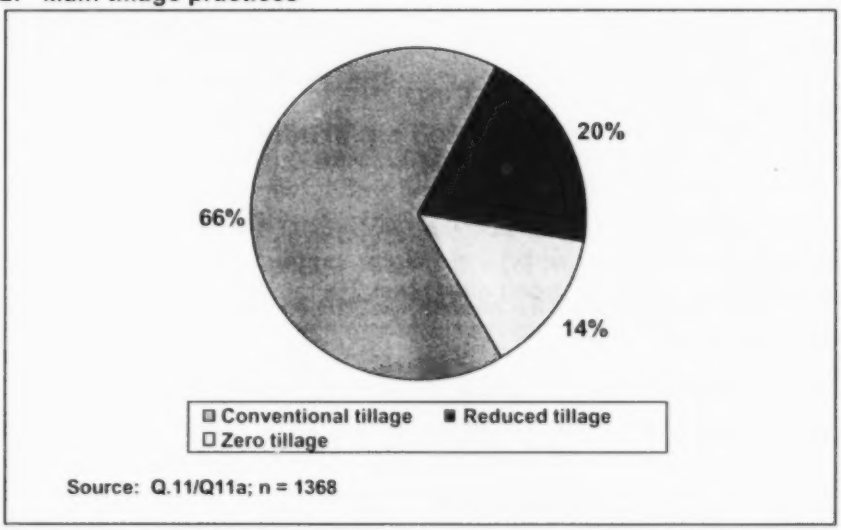
## 6.3 Farming practices of producers with seeded crop land

This part has three topics: tillage practices, soil tests for nutrient management and shelter belts, field belts and wind breaks.

### Tillage practices

The majority of producers with seeded crop land use conventional tillage (66%), 20% use reduced tillage but only 14% use zero tillage as their main tillage practice (Figure 22).

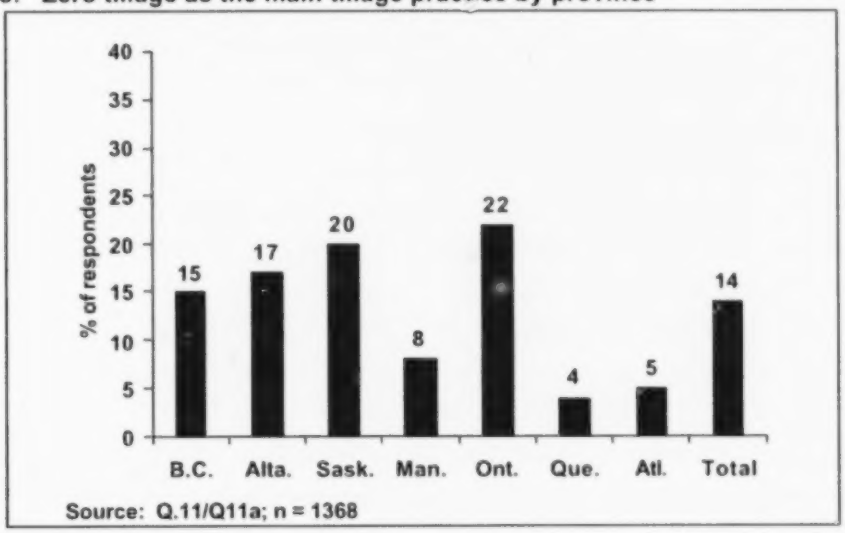
**Figure 22: Main tillage practices**




Compared with the other four main farm types, more field crop producers (20%) indicated they use zero tillage as their main tillage practice.

A higher proportion of producers in Ontario (22%) and Saskatchewan (20%) use zero tillage as their main tillage practice (Figure 23). Producers with larger farms (gross farm sales of $500,000 and over) use zero tillage more often (20%) as their main tillage practice.

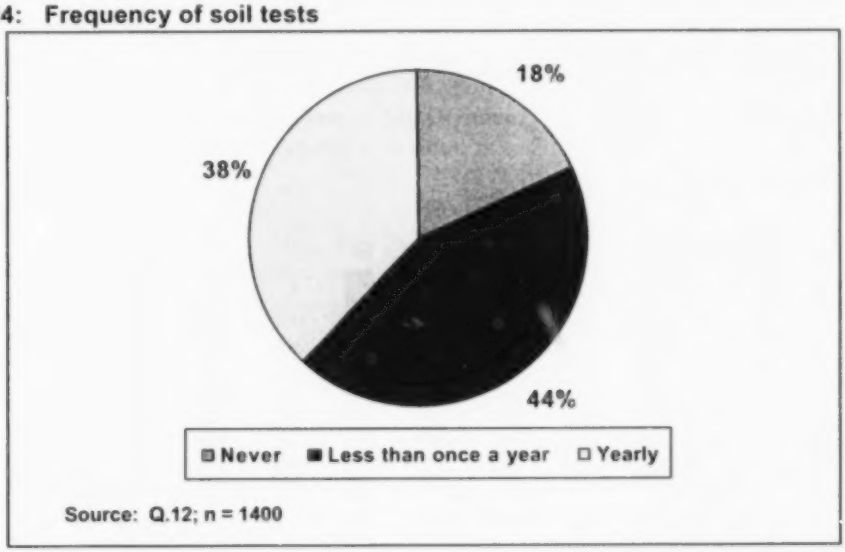
**Figure 23: Zero tillage as the main tillage practice by province**




### Soil tests for nutrient management

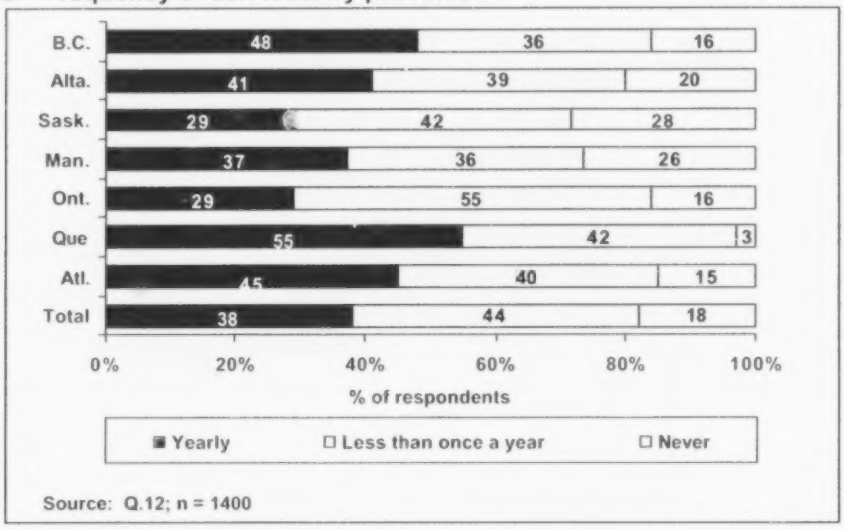
More than a third of producers (38%) with seeded crop land conduct soil tests for nutrient management on a yearly basis (Figure 24).

**Figure 24: Frequency of soil tests**




Producers in Saskatchewan (29%) and Ontario (29%) are the least likely to conduct soil tests on a yearly basis compared with more than half of producers in Quebec (55%) (Figure 25). Beef producers with seeded crop land are the least likely to conduct soil tests – 28% never do soil tests.

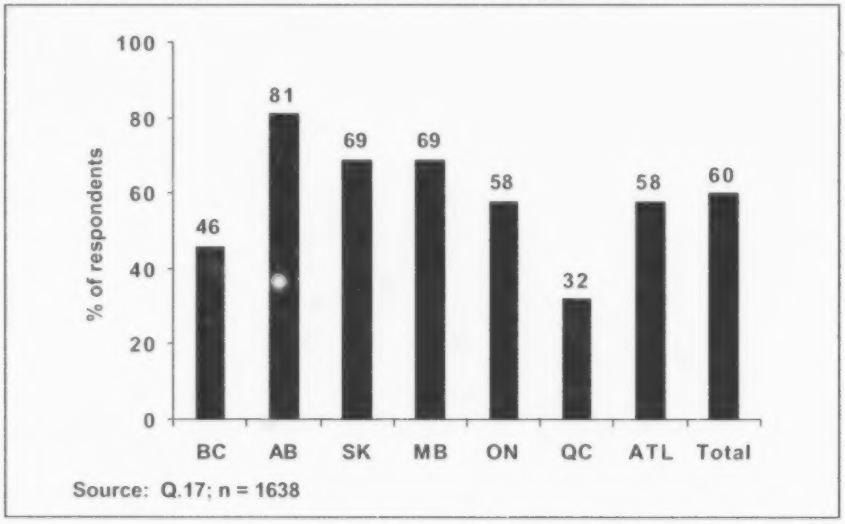
**Figure 25: Frequency of soil tests by province**




### Shelter belts, field belts or wind breaks

Six out of ten producers (60%) have shelter belts, field belts or wind breaks on their farms. Producers in the Prairies have the most, Alberta with 81%, compared to producers in Quebec who are the least likely to have this protection (32%) (Figure 26).

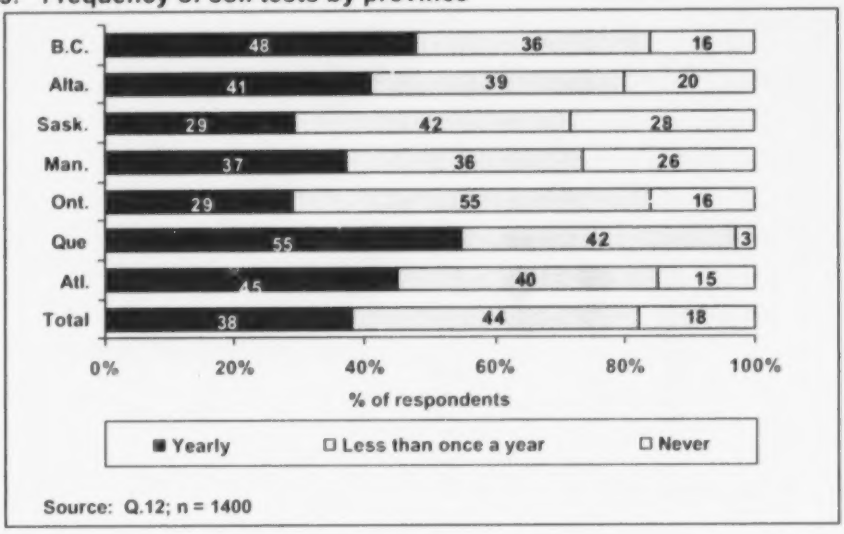
**Figure 26: Shelter belts, field belts or wind breaks by province**




Shelter belts, field belts or wind breaks are more common on beef farms (72%) and field crop farms (64%) compared with dairy, hog or poultry farms (50% or less).

When producers were asked if they would like to plant new shelter belts, field belts or wind breaks in the next three years, only 20% said they intended to do so.[21] Producers who

**Figure 25: Frequency of soil tests by province**

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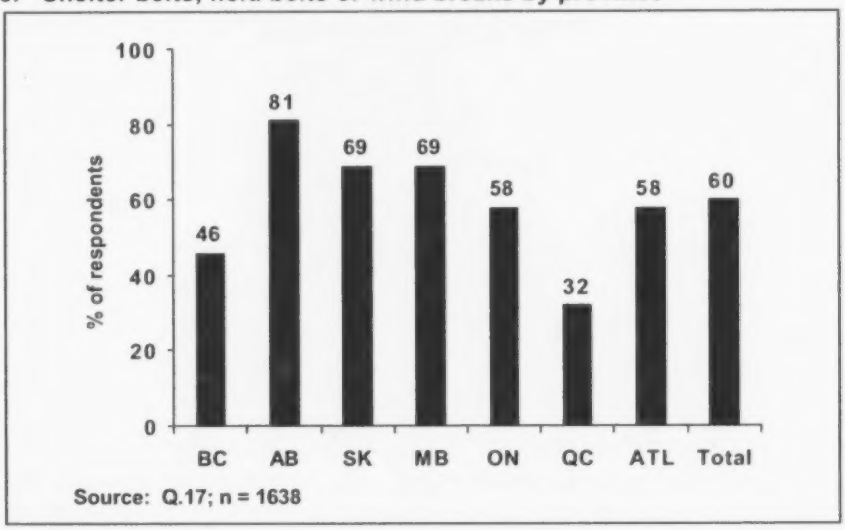



Shelter belts, field belts or wind breaks are more common on beef farms (72%) and field crop farms (64%) compared with dairy, hog or poultry farms (50% or less).

When producers were asked if they would like to plant new shelter belts, field belts or wind breaks in the next three years, only 20% said they intended to do so.[21] Producers who

currently have no such protection are also less likely to plant any – 91% said they did not intend to plant shelter belts, field belts or wind breaks in the future.

Three reasons were stated by producers for planting new shelter belts, field belts or wind breaks:[22]

- erosion control (33%)
- wind break (30%)
- renovating ageing wind break/upgrading (18%).

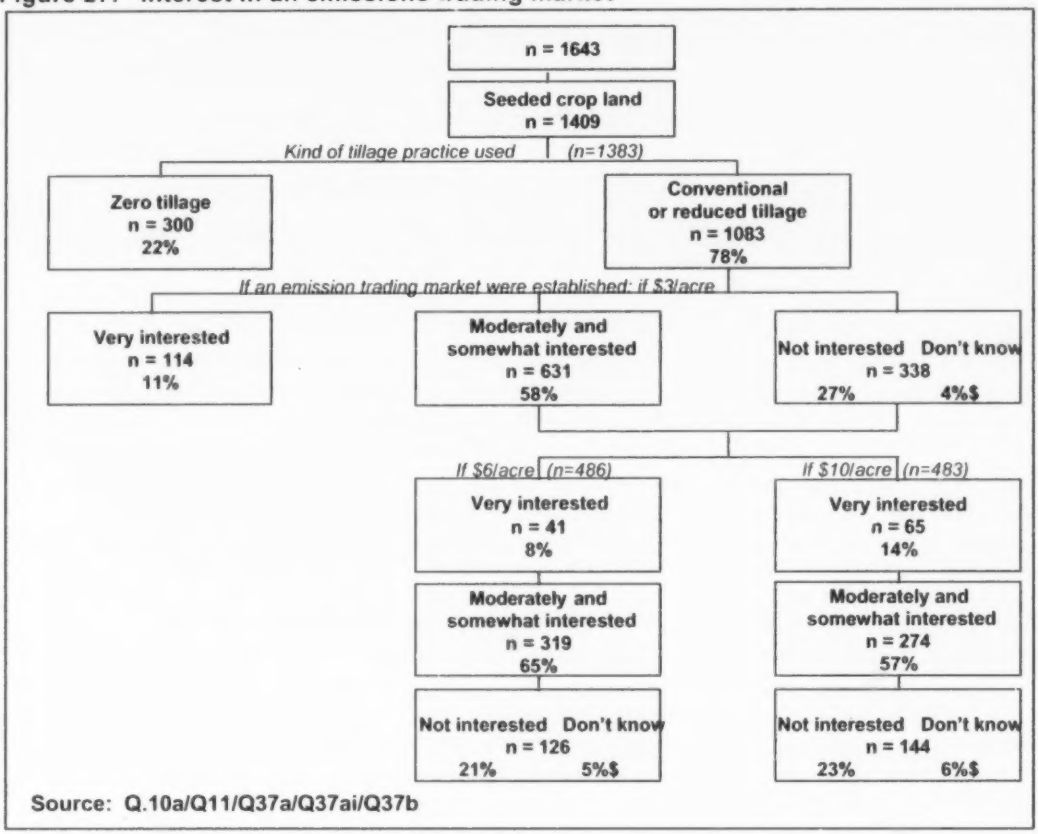
## 6.4 Interest in an emissions trading market

Producers with seeded crop land who indicated that they did not use zero tillage were asked if they would adopt it if an emissions trading market were established. Producers were given a brief description of the principal functioning basis (mechanism) of an emissions trading market. All qualified producers were then asked if they would be interested in adopting zero tillage if an emissions trading market were established and if they were paid $3.00/acre annually (Figure 27). Only 11% of producers indicated they were very interested while 58% indicated they were moderately interested or somewhat interested. But 27% were not interested at all.

Of the producers who indicated they were only moderately interested, somewhat interested, not interested or did not know, half were asked if they would be more interested if they were paid $6.00/acre while the other half were asked if they would be interested if paid $10.00/acre to adopt zero tillage through an emissions trading market. Only 8% who were interested were now very interested at $6.00/acre compared with 14% at $10.00/acre. The percentage of producers that were moderately or somewhat interested remained relatively similar for those at $6.00/acre (65%) as for those at $10.00/acre (57%). In both cases, the percentage of producers that were still not interested remained over 20%.

21. Source: Q.18; n = 1607
22. Source: Q.18a (all mentions); n = 322

**Figure 27: Interest in an emissions trading market**




Producers were also asked what percent of the cost should be paid by producers to adopt farming practices that reduce GHG emissions. One third (32%) think they should contribute between 26% and 50% of the cost in adopting such practices. However, almost another third (29%) believe they should not contribute financially in reducing GHG emissions on their farms.[23]

## 6.5 Manure management practices

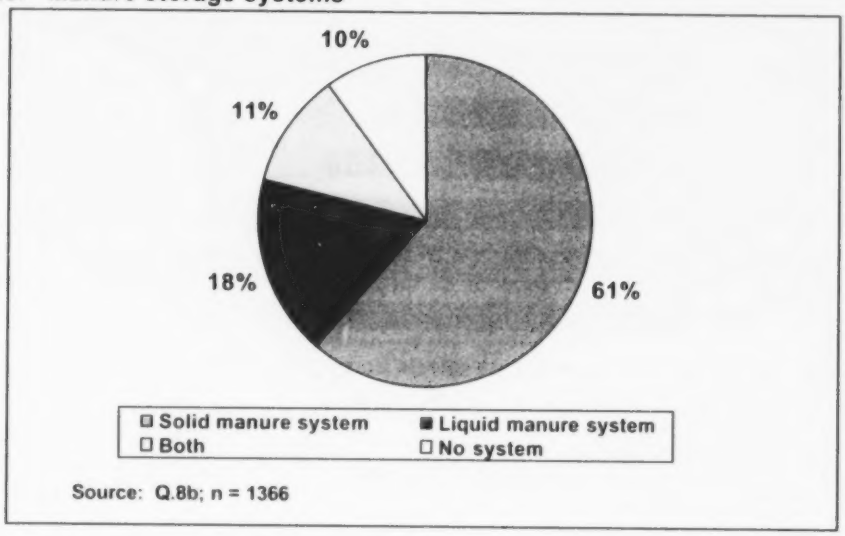
This part on manure management practices has three topics: storage systems, spreading practices and additional practices.

### Storage systems

Six out of ten livestock producers (61%) have a solid manure storage system on their farm. Almost two out of ten (18%) have a liquid manure storage system, one out of ten (11%) claim to have both systems and one out of ten (10%) claim not to use any manure storage system (Figure 28).

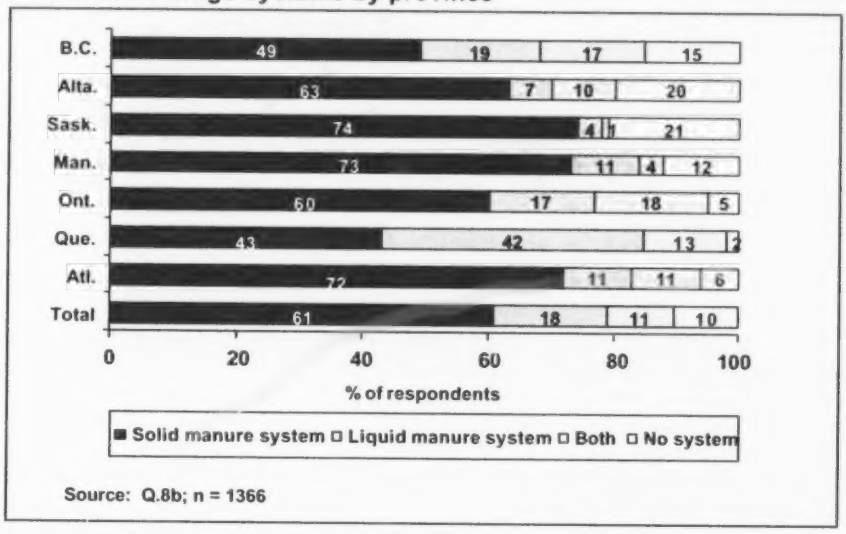
23. Source: Q.35; n = 1505

**Figure 28: Manure storage systems**



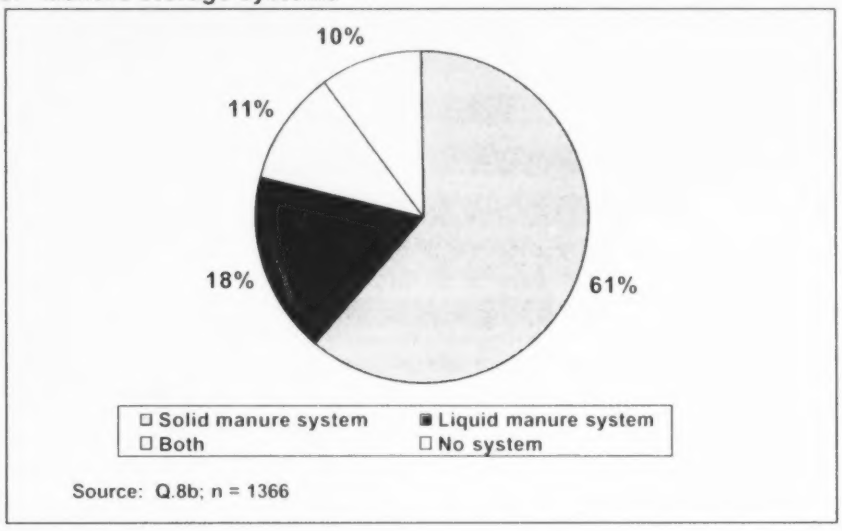

A liquid manure storage system in Quebec (42%) is used as frequently as a solid manure storage system (43%). Producers in Saskatchewan (21%) and Alberta (20%) are the most likely not to have a manure storage system (Figure 29).

**Figure 29: Manure storage systems by province**




Almost two thirds of hog producers (63%) use a liquid manure storage system and 24% have both (solid and liquid) systems. Most beef producers (82%) and field crop producers (74%) have a solid manure storage system but 18% of the field crop producers with livestock indicated they did not have any manure storage system (Figure 30).

**Figure 28: Manure storage systems**

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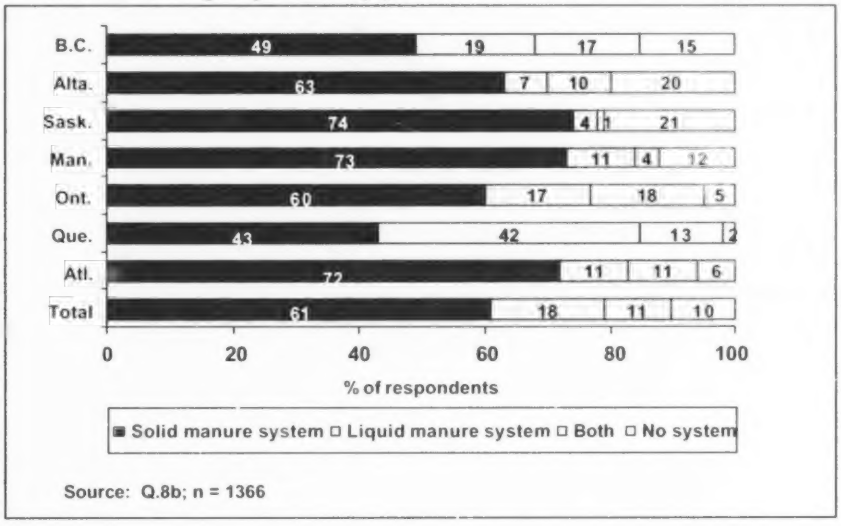
B.C. 49 19 17 15
Alta. 63 7 10 20
Sask. 74 4 1 21
Man. 73 11 4 12
Ont. 60 17 18 5
Que. 43 42 13 2
Atl. 72 11 11 6
Total 61 18 11 10
0 20 40 60 80 100
% of respondents
Solid manure system Liquid manure system Both No system
Source: Q.8b; n = 1366

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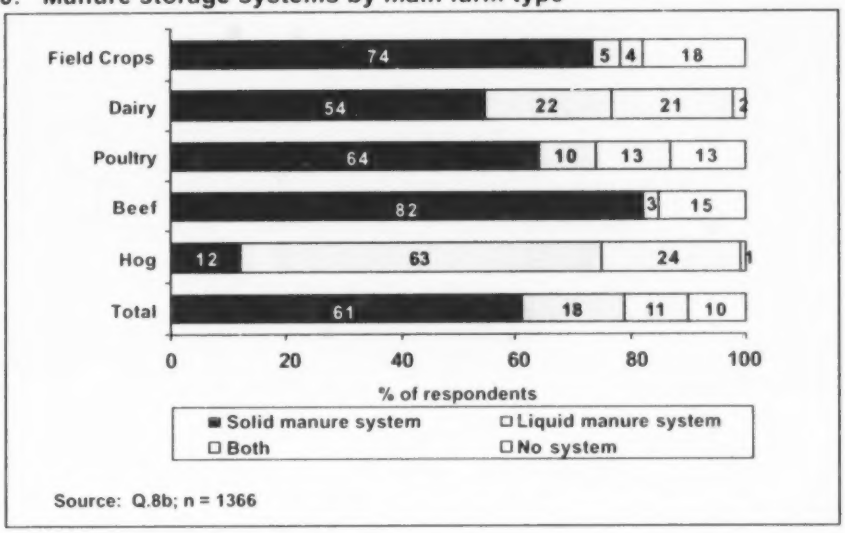
**Figure 30: Manure storage systems by main farm type**




Four out of ten livestock producers (43%) use a bare ground storage system for their manure storage. The four most commonly used bare ground manure storing systems are concrete lagoon (16%), gravel/cement pad (15%), earthen lagoon (12%) and tanks (10%).[24]

### Spreading practices

Almost eight out of ten producers (78%) apply manure on the land they farm. All milk producers (99%) indicated they apply manure on their fields.[25]

Of the producers who apply manure, 64% indicated their last application was in the fall of 2000 (September to November). Of these producers, 51% had also applied manure in the spring (April to May).[26]

### Additional practices

Producers that apply manure on land they farm were asked to indicate how frequently they use various manure management practices (Figure 31). Two thirds of producers (67%) rotate the fields on which they apply manure all the time and 16% rotate the fields most of the time. Milk producers (71%) as well as the producers of Ontario (75%) rotate the fields on which they apply manure more often than others.

Three quarters of producers (76%) say they never spread manure on frozen ground and 19% say they do it some of the time. While 29% of producers in Ontario said they spread manure on frozen ground some of the time, only 1% of producers in Quebec did so. There are no significant differences regarding this practice by farm type.

Only 21% apply manure according to the results of the soil tests all the time and 13% do so most of the time. However, 74% of producers in Quebec apply manure according to the

24. Source: Q9a; n = 1224
25. Source: Q13a; n = 1639
26 Source: Q13b; n = 1265, Q13c; n = 805, Q13d; n = 410

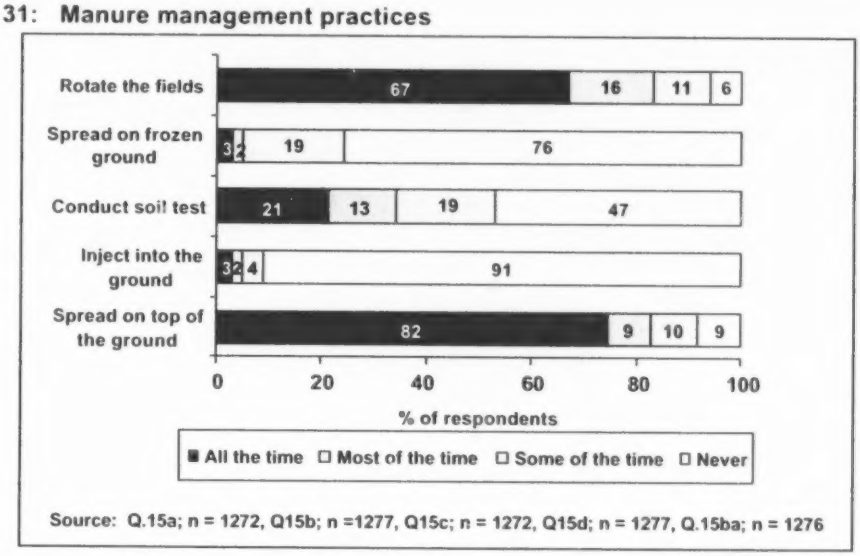
results of soil tests all the time or most of the time. This result contrasts with producers in Saskatchewan where 75% never do soil tests before applying manure. Beef producers (64%) show a greater likelihood never to conduct soil tests before applying manure compared with the other four main farm types. The practice is adopted much more as farm sales increase. Producers with gross farm sales of $250,000 to $499,000 (34%) and those with $500,000 and over (41%) take more advantage of this practice than producers with farm sales below $250,000 (22% or less).

Injecting liquid manure into the ground is not a widely adopted manure management practice. Only 9% of producers make use of this practice although 17% of producers with farm sales of $500,000 and over do inject liquid manure into the ground all of the time or most of the time.

Spreading manure on the top of the ground all the time is a more common practice with 72% of producers doing it.

With rented land, 72% of producers use the same manure management practices as on their own land but beef producers (58%) are less likely to do so.[27]

**Figure 31: Manure management practices**



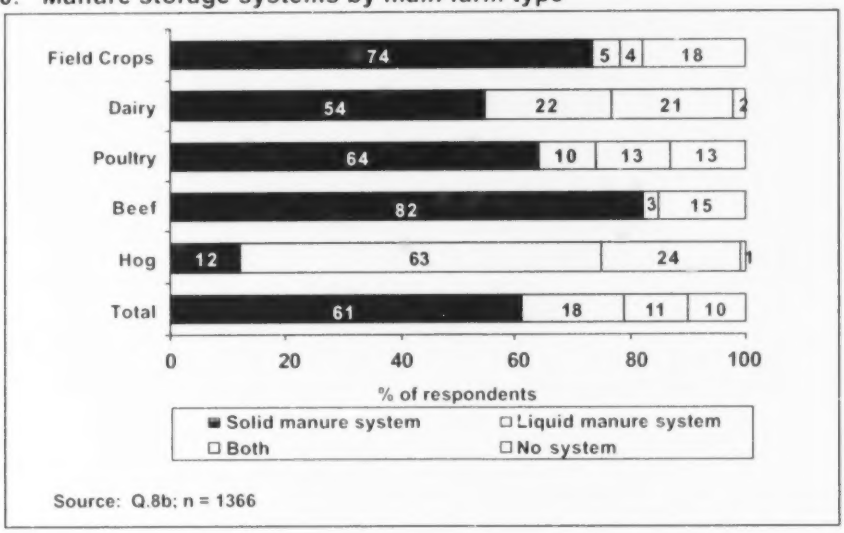

Source: Q.15a; n = 1272, Q15b; n =1277, Q15c; n = 1272, Q15d; n = 1277, Q.15ba; n = 1276

## 6.6 Environmental farm management plan

Producers were asked if they had an environmental farm management plan. While 36% of all producers said yes, when asked if their plan was a formal plan developed in conjunction with a formal environmental program, this percentage dropped to 23% (Figures 32 and 33). Only 19% of those who do not currently have an environmental farm management plan are considering having a formal environmental farm management plan in the future while the majority has not yet decided (70% maybe) (Figure 34).

27. Source: Q.16; n = 647

**Figure 30: Manure storage systems by main farm type**

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25. Source: Q13a; n = 1639
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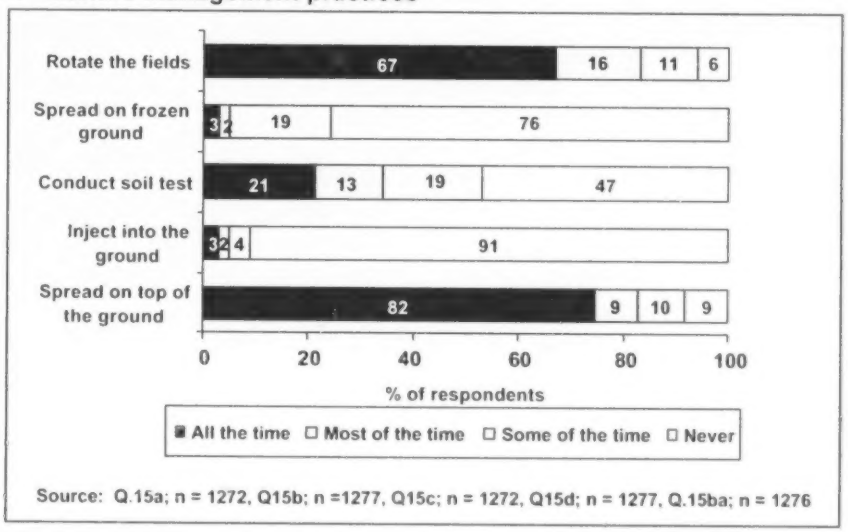


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27. Source: Q.16; n = 647

**Figure 32: Environmental farm management plan**

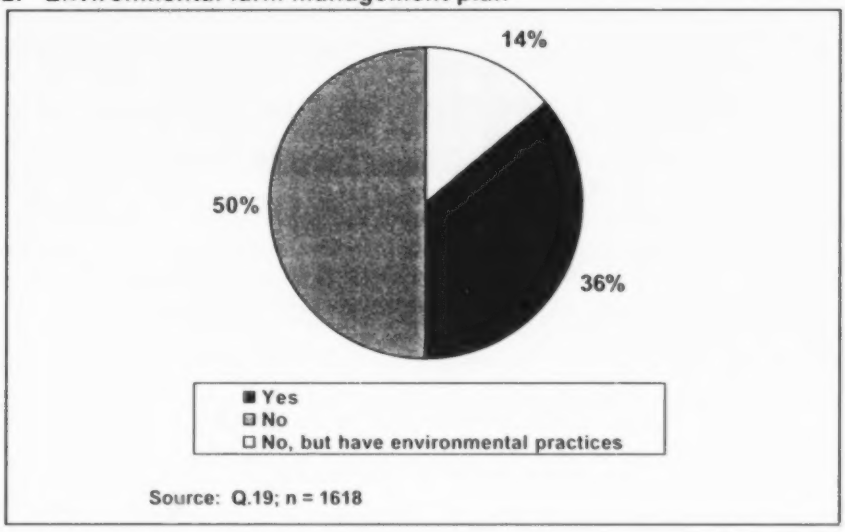



**Figure 33: Formal environmental farm management plan**

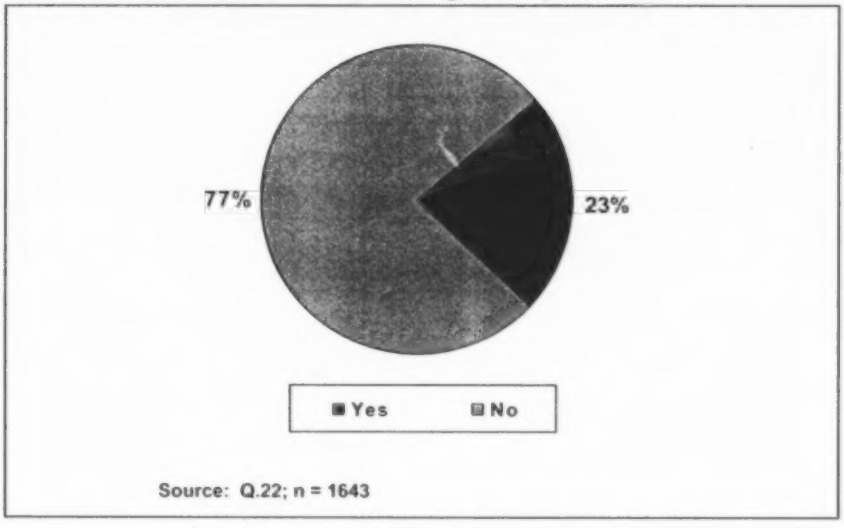
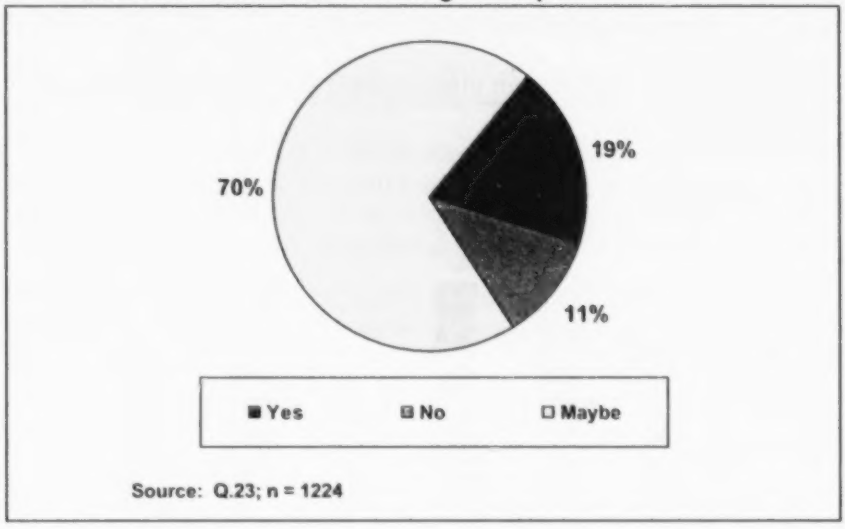
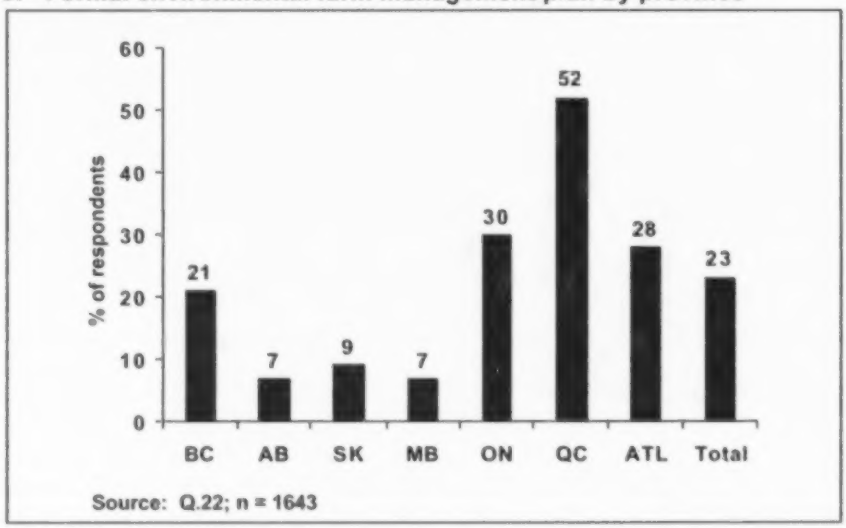


**Figure 34: Future environmental farm management plan**




Formal environmental farm management plans are more predominant in Quebec where 52% of producers report having one compared with 30% of producers in Ontario and 28% of producers in the Atlantic provinces. The lowest proportion of producers with a formal environmental farm management plan are found in Alberta (7%), Manitoba (7%) and Saskatchewan (9%) (Figure 35). Sixty percent of producers in Quebec who do not have a formal environmental farm management plan are considering having one in the future.

**Figure 35: Formal environmental farm management plan by province**




While 39% of hog producers, 38% of milk producers and 37% of poultry producers have adopted a formal environmental farm management plan, beef producers (12%) and field crop producers (13%) are lagging behind in adopting one (Figure 36). Corporations (40%)

are the most likely to have a formal environmental farm management plan as are producers with farm sales of $500,000 and over (39%) (Figure 37).

**Figure 36: Formal environmental farm management plan by main farm type**

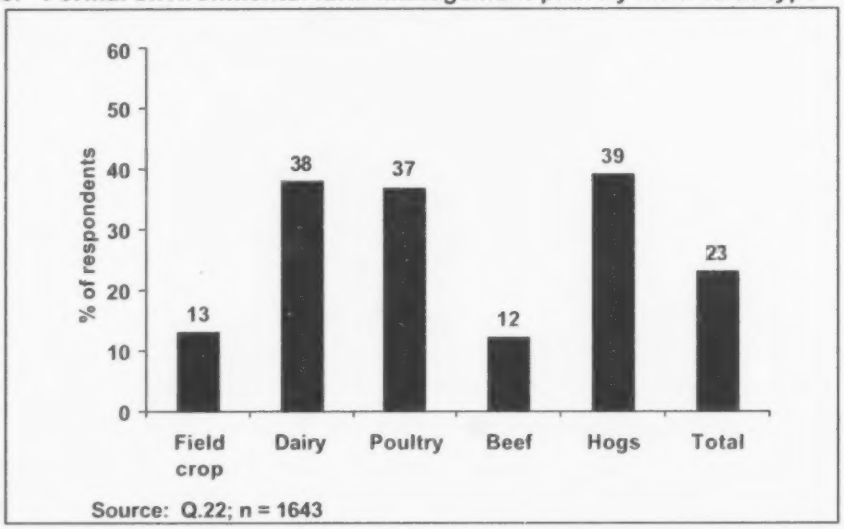
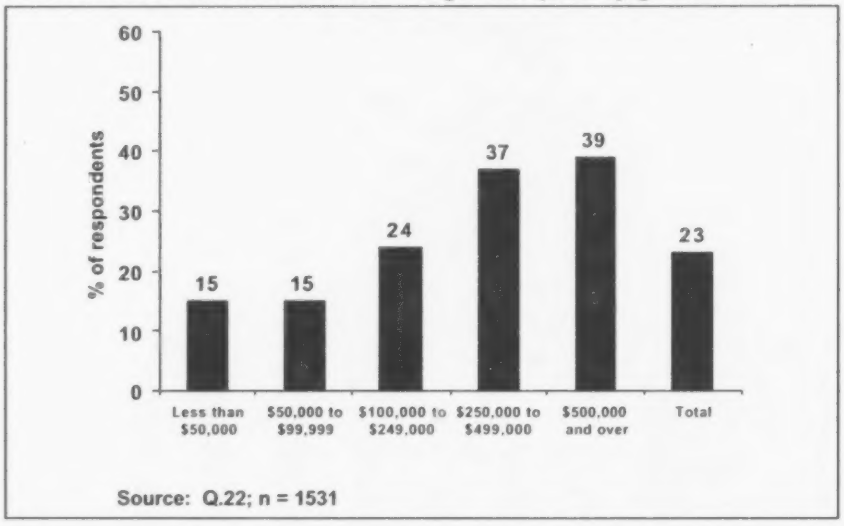



**Figure 37: Formal environmental farm management plan by gross farm sales**




Producers were asked how many years they had had their formal environmental farm management plan.[28] The most frequent number mentioned was three years. In fact, most formal environmental farm management plans (85%) range from one to five years. Formal environmental farm management plans in Quebec (97%) and the Atlantic provinces (93%) are exclusively less than five years old. The majority of formal environmental farm management plans for hog producers (92%) and milk producers (91%) are less than five

28. Source: Q.20; n = 369

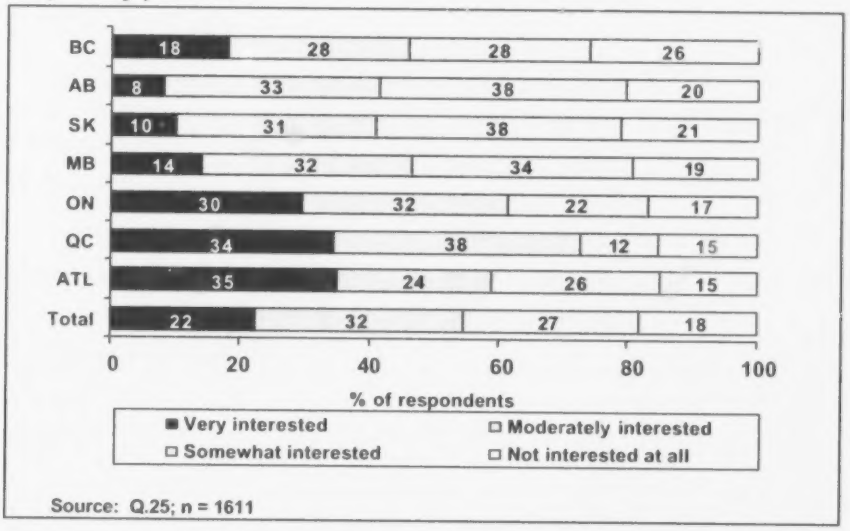
years old while plans of six years or more were more frequently mentioned by field crop producers (29%).

Note that 73% of the producers who have a formal environmental farm management plan claim they have applied all of it or most of it since it was created.[29]

When asked about a program that would help the producers develop an environmental plan for their farms, only 22% would be very interested and 32% would be moderately interested. Among the producers who have a formal environmental plan, 42% are very interested in such a program compared with only 15% among those who do not have a formal plan.

Producers in the Atlantic provinces (35%) and in Quebec (34%) are more inclined to be very interested in a program that would help them develop an environmental plan for their farms. Producers in Manitoba (14%), Saskatchewan (10%) and Alberta (8%) are less inclined to be very interested in such a program (Figure 38).

**Figure 38: Interest in a program to help develop an environmental farm management plan by province**




Interest is highest among milk producers (35% very interested) for a program that would help them develop an environmental plan for their farms. Only 18% of beef producers and 14% of field crop producers are very interested in such a program (Figure 39).

29. Source : Q.21; n = 380

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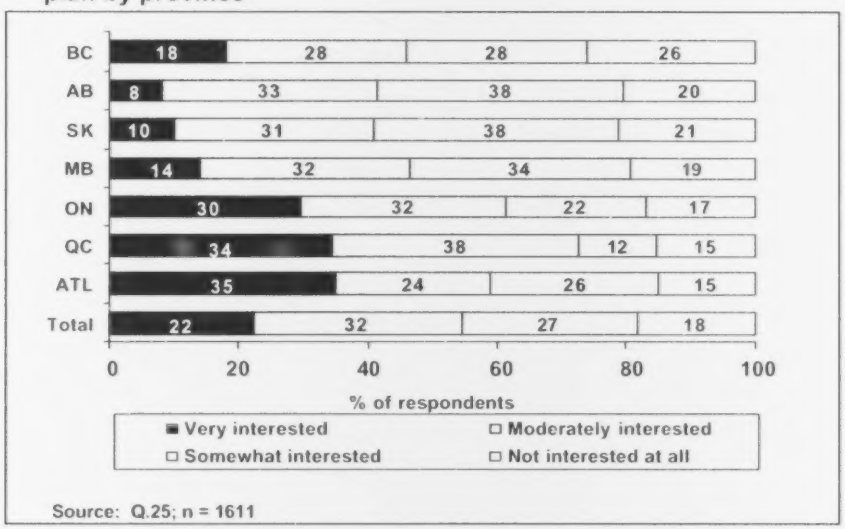


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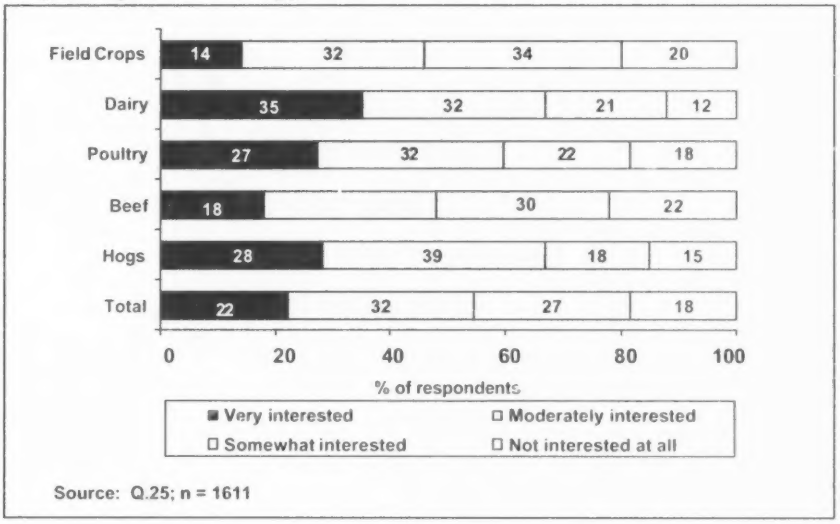
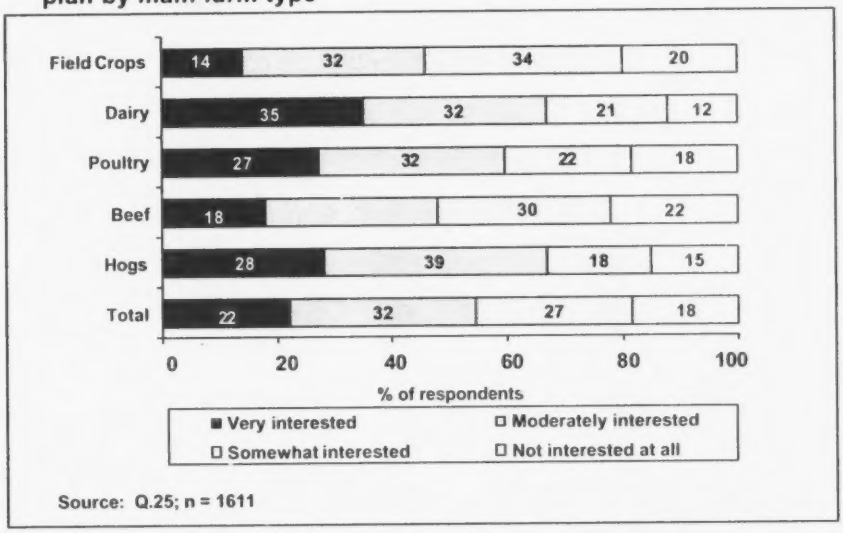
**Figure 39: Interest in a program to help develop an environmental farm management plan by main farm type**




Source: Q.25; n = 1611

Producers with farm sales of $500,000 and over (33%) and $250,000 to $500,000 (29%) are more inclined to be very interested in a program that would help them develop an environmental plan compared with producers with sales below $250,000 (22% or less).

**Figure 39: Interest in a program to help develop an environmental farm management plan by main farm type**

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# Section 7: Qualitative research: communicating the message

The purpose of the qualitative research (six focus groups) was to understand the awareness of GHG emissions and climate change as they relate to agriculture and to differentiate the possible communication methods that could increase this awareness.

This section has three parts: the environment, GHG emissions and communicating the message.

## 7.1 Environment

The producers feel the general public perceives them negatively when it comes to the environment. When evaluating public perception, their main preoccupation remained local, i.e. odour and river bank management. When asked if agriculture was good or bad for the environment, producers were unanimous in saying they "work with nature" and respect the natural environment. Compared with the pollution caused by industry, producers believe they have nothing to be ashamed of. In general, many producers blame GHG emissions on the increase in vehicles on our highways and on the more industrial parts of Canada.

The main impact that the producers feel their operations may have on the environment is tied to manure management and pesticides. On this point, all producers believed they have modified their practices in the last decade to address environmental concerns. Sensitive to environmental issues, they acted not only from individual concern but also in response to strict legislation on manure management and river bank management. In the case of small field crop farms, many say they have greatly reduced herbicide use and have modified the way they work the soil.

## 7.2 Greenhouse gas emissions

Producers identified GHG emissions as coming from carbon monoxide (fossil fuels) and aerosol sprays. While some are concerned with the impact of GHG emissions on global warming, saying it could lead to greater erosion and drought, most producers said it could allow them to sow earlier and to use new breeds.

When asked what caused GHG emissions in farming, most producers identified methane from manure and fossil fuel-burning farm equipment. They believed they had already acted on the issue of GHG emissions by meeting the regulatory requirements tied to manure storage.

Urban life and manufacturing were blamed for GHG emissions while producers believed they were responsible for a very small part of GHG production. When prompted with the fact that they produced 10% of GHG emissions in Canada, most producers believed this was a positive figure. As one said, "We are responsible for 10%, yet we occupy 90% of the territory – not bad at all."

While ready to consider any advice on ways to reduce GHG emissions on their farms, producers will do so as long as the impact on costs is limited. Investments to meet new environmental guidelines have made them fearful of what the government will ask next. Blaming market prices as being too low to allow them to make a decent margin, producers say they do not have the money to do much. However, they all said they were concerned about the environment and would be ready to listen to innovative suggestions on how they could modify their practices.

## 7.3 Communication

The producers offered eight suggestions or methods to improve the dispersal of information and to increase the awareness of climate change and GHG emissions:

- Consistently, farm publications and producer associations were regarded as the best source of information on GHG emissions. When probed for other potential sources of information on the environment, producers tended to remain fairly traditional.
- Fact sheets could work, but brochures tend to be read quickly and then tossed in the garbage.
- Farm fair displays are a possibility because they all attend fairs and trade shows. They would stop at a kiosk or listen to a lecture or seminar on GHG emissions at a trade show.
- Some would go to a web site but it would have to be associated with a local producer association.
- GHG on-farm audit templates would work for a few, especially if they could post a sign saying they had passed the audit.
- A series of articles in farm publications would get their attention and would be widely read. However, readership and consideration would vary depending on the source of the articles. If it comes from a source which has a vested interest in agriculture (union, industry, government), some would question the credibility of the articles.

- A majority would attend a demonstration of environmental farm planning tools or pay attention to it, depending on who was responsible for it. A group including government, trade organizations and independent researchers would be interesting, but they would question the demonstration if it came from a single source.
- If speakers and researchers were independent, most producers would attend seminars. A one-day conference during a trade show, which would discuss findings from independent research, would get the attention of producers.

# Section 8: Summary and recommendations

## 8.1 Summary

This report provides timely information on the current level of awareness regarding climate change and GHG emissions among agricultural producers. The report also determines the extent to which producers understand how current management practices could reduce GHG emissions or enhance carbon sinks and how this behaviour could be affected by government policies.

The first objective of the report was to measure the level of awareness and understanding of climate change and GHG issues by agricultural producers. We found that the exposure to climate change and GHG information was limited as only one out of four producers (24%) received information on it. In contrast, the majority of producers (85%) were exposed (in the preceding year) to agriculture information relevant to their farm operation.

The level of awareness of agriculture's contribution to GHG emissions is also low – only 25% of producers agreed that "agriculture contributes 10% of Canada's total GHG emissions" while 30% disagreed and 45% did not know.

Also to measure awareness and understanding, producers were asked to identify the impact of six common farming practices on climate change. The majority of producers (55%-84%) could not identify whether the impact was beneficial or detrimental. For example, conservation tillage (reduced/zero tillage) is **beneficial** since it decreases the impact on climate change – 41% of producers agreed, 30% thought it has no impact and 18% believed it increases the impact. In contrast, free range (intensive) grazing is **detrimental** since it increases the impact on climate change. Only 16% of producers recognized the detrimental impact, another 16% thought the opposite – that it decreases the impact – but 53% thought that free range grazing has no impact.

Only 16% of producers are familiar with carbon sequestration or carbon sink farming practices and with the role of an emissions trading market. If such a market were created for

producers in Canada, various communication and training activities are needed to raise the awareness and understanding first of these practices and second of the role of this market.

Producers were also asked their views on the future impact of climate change on Canadian agriculture. There is no consensus among producers – 30% expect a positive impact and 26% expect a negative impact. However, one third (34%) believe there will be no impact.

Producers, who believe that climate change will have an impact (either positive or negative), were asked to give their opinion on more specific environmental impacts of climate change related to agricultural activities. While they anticipate negative consequences such as extreme weather and dryer seasons, they also anticipate positive consequences such as longer growing seasons and the introduction of new crop varieties.

The second objective of the report was to identify the use of certain current agricultural practices that relate to GHG emissions. Zero tillage is an example of a farming practice that provides many environmental benefits, including the ability to sequester carbon in the soil thus reducing GHG emissions. Currently, only 14% or producers with seeded crop land use zero tillage, 20% use reduced tillage but 66% use conventional tillage as their main tillage practice.

When producers have an environmental farm management plan, they modify their farming practices to improve the quality of the soil, water, air and woodlands. As an example they can adopt their livestock, nutrient and soil management practices to reduce GHG emissions. But less than one quarter (23%) have an environmental farm management plan developed in conjunction with an environmental program. Only 19% of producers, who do not currently have a plan, are considering having one while 70% have not yet decided.

The third objective of the report was to measure the level of commitment to adopting new farming practices to reduce GHG emissions. To measure this level, producers were asked if they were willing to reduce GHG emissions voluntarily or with government assistance. On a voluntary basis, 33% of producers are willing but 29% are not willing. If they received government assistance, the producers who indicated they were not at all willing, not willing or uncertain were asked if they would reduce GHG emissions on their farms. With government assistance, 38% of those modified their position and became willing to reduce GHG emissions. Combining the voluntary basis responses with the government assistance responses, we find that 58% of producers were willing to reduce GHG emissions while those unwilling drops to 21%. The remaining producers (21%) were uncertain of their intent to reduce GHG emissions

The fourth objective of the report was reached as it established a baseline to evaluate the success of awareness and public education programs on climate change and GHG emissions.

Producers have demonstrated that they can modify their farming practices to improve the quality of the soil, water, air and woodlands. But for producers to modify their livestock, nutrient and soil management practices, they need the information that will allow them to understand the impact of the choices available to them and the technologies they can use to reduce GHG emissions and improve the quality of the environment. Producers anticipate receiving that information as 70% are interested in receiving factual information about GHG emissions from the government.

When more producers gain an understanding of the impact of the livestock, nutrient and soil management practices on GHG emissions and how this impact relates to broader environmental management goals, we can anticipate a similar modification. This information would also help producers and the agricultural sector to develop a consensus on common goals and approaches for reducing GHG emissions and enhancing soil sinks. However, the rate of change will be affected by the underlying costs and benefits, which imply a potentially larger role for the government in trying to match the desired society outcomes with private interests.

## 8.2 Recommendations for future surveys related to GHG and the environment

In this survey, we learned the market penetration of an environmental farm management plan. In follow-up surveys to refine the information derived from this plan, questions should be added to isolate the impact on GHG emissions and the environment of the livestock, nutrient and soil management practices of the farms.

As more experience is gained with the use of those plans, we could add questions that would enable researchers to develop more precise measures of four factors:

- the level of implementation of the plan
- the link between the agricultural management practices as a result of the implementation of the plan and their environmental impact on GHG emissions, soil, water, air and woodlands, and the quality, salubrity and tracability of farm products
- the impact on productivity and profitability of the farm operation from the implementation of the plan
- the perceived benefits to the farm operation and the community.

It would also be useful to know who were the authors of the environmental plans and if they were developed voluntarily or in response to government regulations.

Programs, activities and training vehicles have been developed to raise the awareness and understanding of climate change and GHG emissions and to promote the adoption of livestock, nutrient and soil management practices that reduce GHG emissions. A follow-up to this survey in 2004 would enable us to measure the impact of these programs, activities and training vehicles and serve as an information baseline for future programs development.

# Appendix A: Tables

**Table A1: Exposure to agricultural and environmental information**

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q2. Have you read, seen or heard any information on issues of importance to agriculture?** | | | | | | | | |
| Yes | 79 | 84 | 84 | 86 | 86 | 88 | 79 | 85 |
| No | 21 | 16 | 16 | 14 | 14 | 12 | 21 | 15 |
| Don't know (n = 6) | | | | | | | | |
| **Q3. How did you receive this information? (First mentions) (n = 1387)** | | | | | | | | |
| Others farmers/word of mouth | 1 | 3 | 1 | 2 | 2 | 6 | 3 | 3 |
| Agricultural journal | 11 | 4 | 10 | 8 | 7 | 47 | 6 | 15 |
| Internet | | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Newspapers | 24 | 41 | 41 | 47 | 30 | 27 | 23 | 34 |
| Television | 1 | 3 | 7 | 4 | 2 | 4 | 5 | 4 |
| Radio | 1 | 9 | 7 | 4 | 3 | | 1 | 4 |
| Postal services | 13 | 16 | 15 | 8 | 10 | 3 | 12 | 10 |
| Magazines/books | 37 | 17 | 13 | 16 | 39 | 1 | 34 | 21 |
| Associations/organisations | 5 | 5 | 2 | 3 | 3 | 5 | 7 | 4 |
| Others | 6 | 1 | 3 | 6 | 3 | 6 | 8 | 4 |
| Don't know (n = 7) | | | | | | | | |
| **Q3. How did you receive this information? (All mentions) (n = 1387)** | | | | | | | | |
| Others farmers/word of mouth | 8 | 8 | 7 | 7 | 8 | 22 | 12 | 10 |
| Agricultural journal | 18 | 7 | 13 | 13 | 11 | 69 | 11 | 22 |
| Internet | 8 | 8 | 7 | 8 | 6 | 5 | 2 | 6 |
| Newspapers | 43 | 56 | 57 | 65 | 44 | 49 | 43 | 51 |
| Television | 9 | 23 | 39 | 33 | 23 | 22 | 21 | 25 |
| Radio | 11 | 30 | 33 | 32 | 16 | 5 | 16 | 21 |
| Postal services | 20 | 23 | 19 | 15 | 14 | 4 | 17 | 15 |
| Magazines/books | 51 | 30 | 22 | 28 | 56 | 1 | 55 | 33 |
| Associations/organisations | 10 | 8 | 4 | 4 | 9 | 9 | 13 | 8 |
| Others | 14 | 8 | 13 | 15 | 12 | 33 | 14 | 16 |
| Don't know (n = 7) | | | | | | | | |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q3a. Who was responsible for this information? (n = 1387)** | | | | | | | | |
| Extension services | 33 | 38 | 54 | 40 | 24 | 57 | 38 | 40 |
| Financial institution | 32 | 31 | 38 | 35 | 21 | 27 | 25 | 29 |
| Producer association | 73 | 76 | 74 | 80 | 81 | 73 | 76 | 77 |
| Government | 49 | 54 | 62 | 53 | 33 | 54 | 42 | 49 |
| Industry | 51 | 48 | 57 | 53 | 46 | 35 | 46 | 47 |
| None of these | 3 | 6 | 3 | 2 | 6 | 4 | 5 | 5 |
| Don't know (n = 45) | | | | | | | | |
| **Q24. Which source would you expect to be the best for information on environmental plans? (n = 750)** | | | | | | | | |
| Extension services | 24 | 41 | 54 | 40 | 40 | 59 | 43 | 47 |
| Financial institutions | | 2 | 2 | 5 | 1 | | 2 | 1 |
| Producer associations | 39 | 27 | 21 | 33 | 32 | 24 | 33 | 29 |
| Government | 27 | 22 | 13 | 17 | 18 | 11 | 15 | 16 |
| Industry | 9 | 8 | 10 | 5 | 9 | 6 | 7 | 8 |
| Don't know (n = 32) | | | | | | | | |
| **Q4a. Are you connected to the Internet?(n = 1643)** | | | | | | | | |
| Yes | 43 | 48 | 38 | 36 | 45 | 55 | 46 | 45 |
| No | 57 | 52 | 62 | 64 | 55 | 45 | 54 | 55 |
| **Q4b. How frequently do you use the Internet? (n = 739)** | | | | | | | | |
| Daily | 48 | 45 | 43 | 36 | 45 | 32 | 46 | 41 |
| Weekly | 31 | 34 | 33 | 43 | 42 | 45 | 28 | 39 |
| Monthly | 5 | 12 | 11 | 8 | 6 | 11 | 8 | 9 |
| Less than once a month | 17 | 9 | 12 | 14 | 7 | 11 | 18 | 11 |
| Don't know (n = 17) | | | | | | | | |
| **Q39. Have you received any information on GHGs or climate change?** | | | | | | | | |
| Yes | 23 | 26 | 30 | 23 | 24 | 19 | 21 | 24 |
| No | 77 | 74 | 70 | 77 | 76 | 81 | 79 | 76 |
| Don't know (n = 24) | | | | | | | | |
| **Q40. Are you interested in receiving information on GHGs from the government?** | | | | | | | | |
| Yes | 69 | 66 | 68 | 68 | 66 | 82 | 77 | 70 |
| No | 31 | 34 | 32 | 32 | 34 | 18 | 23 | 30 |
| Don't know (n = 20) | | | | | | | | |
| **Q41. Are you interested in seminar or training courses on farming practices to help reduce GHGs?** | | | | | | | | |
| Yes | 50 | 48 | 49 | 50 | 49 | 60 | 64 | 52 |
| No | 50 | 52 | 51 | 50 | 51 | 40 | 36 | 48 |
| Don't know (n = 63) | | | | | | | | |

## Table A1: Exposure to agricultural and environmental information

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q2. Have you read, seen or heard any information on issues of importance to agriculture?** | | | | | | |
| Yes | 84 | 88 | 86 | 81 | 89 | 85 |
| No | 16 | 12 | 14 | 19 | 11 | 15 |
| Don't know (n = 6) | | | | | | |
| **Q3. How did you receive this information? (First mentions) (n = 1387)** | | | | | | |
| Others farmers/word of mouth | 1 | 3 | 5 | 3 | 3 | 3 |
| Agricultural journal | 10 | 24 | 16 | 10 | 19 | 15 |
| Internet | 2 | 1 | 2 | 2 | 1 | 2 |
| Newspapers | 39 | 26 | 27 | 38 | 33 | 34 |
| Television | 4 | 3 | 1 | 4 | 3 | 4 |
| Radio | 5 | 2 | 1 | 5 | 2 | 4 |
| Postal services | 13 | 10 | 6 | 10 | 9 | 10 |
| Magazines/books | 19 | 24 | 27 | 20 | 20 | 21 |
| Associations/organizations | 2 | 3 | 8 | 3 | 5 | 4 |
| Others | 2 | 3 | 9 | 5 | 5 | 4 |
| Don't know (n = 7) | | | | | | |
| **Q3. How did you receive this information? (All mentions) (n = 1387)** | | | | | | |
| Others farmers/word of mouth | 7 | 12 | 15 | 10 | 13 | 10 |
| Agricultural journal | 15 | 34 | 28 | 15 | 31 | 22 |
| Internet | 9 | 4 | 7 | 6 | 4 | 6 |
| Newspapers | 57 | 45 | 43 | 51 | 52 | 51 |
| Television | 32 | 22 | 16 | 27 | 20 | 25 |
| Radio | 27 | 13 | 10 | 26 | 14 | 21 |
| Postal services | 18 | 17 | 13 | 14 | 11 | 15 |
| Magazines/books | 30 | 22 | 28 | 56 | 55 | 33 |
| Associations/oraganisations | 5 | 8 | 14 | 7 | 13 | 8 |
| Others | 11 | 16 | 26 | 15 | 22 | 16 |
| Don't know (n = 7) | | | | | | |
| **Q3a. Who was responsible for this information? (n = 1387)** | | | | | | |
| Extension services | 45 | 43 | 31 | 32 | 46 | 40 |
| Financial institution | 36 | 24 | 24 | 25 | 30 | 29 |
| Producer association | 76 | 75 | 84 | 75 | 81 | 77 |
| Government | 55 | 46 | 43 | 48 | 45 | 49 |
| Industry | 56 | 42 | 50 | 41 | 46 | 47 |
| None of these | 4 | 5 | 5 | 5 | 4 | 5 |
| Don't know (n = 45) | | | | | | |
| **Q24. Which source would you expect to be the best for information on environmental plans? (n = 750)** | | | | | | |
| Extension services | 46 | 50 | 44 | 41 | 50 | 47 |
| Financial institutions | 1 | 1 | 1 | 3 | | 1 |
| Producer associations | 24 | 28 | 29 | 36 | 28 | 29 |
| Government | 21 | 13 | 16 | 14 | 16 | 16 |
| Industry | 8 | 8 | 10 | 7 | 6 | 8 |
| Don't know (n = 32) | | | | | | |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q4a. Are you connected to the Internet? (n = 1643)** | | | | | | |
| Yes | 46 | 46 | 67 | 34 | 50 | 45 |
| No | 54 | 54 | 33 | 66 | 50 | 55 |
| **Q4b. How frequently do you use the Internet? (n = 739)** | | | | | | |
| Daily | 42 | 39 | 48 | 42 | 36 | 41 |
| Weekly | 38 | 37 | 40 | 38 | 44 | 39 |
| Monthly | 12 | 9 | 9 | 7 | 6 | 9 |
| Less than once a month | 8 | 15 | 3 | 14 | 14 | 11 |
| Don't know (n = 17) | | | | | | |
| **Q39. Have you received any information on GHGs or climate change?** | | | | | | |
| Yes | 27 | 24 | 28 | 20 | 22 | 24 |
| No | 73 | 76 | 72 | 80 | 78 | 76 |
| Don't know (n = 24) | | | | | | |
| **Q40. Are you interested in receiving information on GHGs from the government?** | | | | | | |
| Yes | 69 | 71 | 71 | 69 | 75 | 70 |
| No | 31 | 29 | 29 | 31 | 25 | 30 |
| Don't know (n = 20) | | | | | | |
| **Q41. Are you interested in seminar or training courses on farming practices to help reduce GHGs?** | | | | | | |
| Yes | 49 | 56 | 55 | 51 | 55 | 52 |
| No | 51 | 44 | 45 | 49 | 45 | 48 |
| Don't know (n = 63) | | | | | | |

## Table A1: Exposure to agricultural and environmental information

| Farm Sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q2. Have you read, seen or heard any information on issues of importance to agriculture?** | | | | | | |
| Yes | 77 | 79 | 89 | 92 | 94 | 85 |
| No | 23 | 21 | 11 | 8 | 6 | 15 |
| Don't know (n = 6) | | | | | | |
| **Q3. How did you receive this information? (First mentions) (n = 1387)** | | | | | | |
| Others farmers/word of mouth | 3 | 1 | 2 | 2 | 6 | 3 |
| Agricultural journal | 11 | 13 | 15 | 18 | 20 | 15 |
| Internet | 1 | 0 | 2 | 3 | 3 | 2 |
| Newspapers | 32 | 38 | 38 | 30 | 30 | 34 |
| Television | 5 | 7 | 2 | 3 | 2 | 4 |
| Radio | 6 | 3 | 4 | 3 | 2 | 4 |
| Postal services | 12 | 9 | 10 | 11 | 7 | 10 |
| Magazines/books | 25 | 20 | 20 | 24 | 18 | 21 |
| Associations/oraganisations | 3 | 3 | 3 | 4 | 7 | 4 |
| Others | 3 | 5 | 5 | 3 | 5 | 4 |
| Don't know (n = 7) | | | | | | |
| **Q3. How did you receive this information? (All mentions) (n = 1387)** | | | | | | |
| Others farmers/word of mouth | 10 | 8 | 9 | 12 | 16 | 10 |
| Agricultural journal | 17 | 17 | 23 | 28 | 29 | 22 |
| Internet | 5 | 7 | 6 | 10 | 8 | 8 |
| Newspapers | 48 | 53 | 54 | 53 | 49 | 52 |
| Television | 25 | 30 | 28 | 23 | 19 | 26 |
| Radio | 22 | 21 | 24 | 19 | 14 | 21 |
| Postal services | 16 | 12 | 15 | 16 | 14 | 15 |
| Magazines/books | 36 | 32 | 31 | 32 | 31 | 33 |
| Associations/oraganisations | 7 | 5 | 8 | 8 | 12 | 8 |
| Others | 12 | 17 | 15 | 16 | 26 | 16 |
| Don't know (n = 7) | | | | | | |
| **Q3a. Who was responsible for this information? (n = 1387)** | | | | | | |
| Extension services | 32 | 37 | 45 | 46 | 44 | 41 |
| Financial institution | 25 | 29 | 29 | 34 | 31 | 29 |
| Producer association | 74 | 76 | 78 | 76 | 82 | 77 |
| Government | 43 | 51 | 50 | 49 | 52 | 49 |
| Industry | 38 | 48 | 49 | 47 | 58 | 47 |
| None of these | 7 | 2 | 4 | 2 | 3 | 4 |
| Don't know (n = 45) | | | | | | |
| **Q24. Which source would you expect to be the best for information on environmental plans? (n = 750)** | | | | | | |
| Extension services | 30 | 47 | 56 | 46 | 50 | 48 |
| Financial institutions | 3 | 1 | 1 | 1 | | 1 |
| Producer associations | 41 | 29 | 23 | 31 | 25 | 29 |
| Government | 23 | 18 | 13 | 14 | 15 | 16 |
| Industry | 4 | 5 | 6 | 8 | 10 | 7 |
| Don't know (n = 32) | | | | | | |

| Farm Sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q4a. Are you connected to the Internet? (n = 1643)** | | | | | | |
| Yes | 28 | 36 | 48 | 62 | 74 | 46 |
| No | 72 | 64 | 52 | 38 | 26 | 54 |
| **Q4b. How frequently do you use the Internet? (n = 739)** | | | | | | |
| Daily | 40 | 43 | 42 | 38 | 42 | 41 |
| Weekly | 42 | 33 | 35 | 43 | 42 | 39 |
| Monthly | 11 | 10 | 11 | 3 | 8 | 9 |
| Less than once a month | 6 | 14 | 11 | 16 | 8 | 11 |
| Don't know (n = 17) | | | | | | |
| **Q39. Have you received any information on GHGs or climate change?** | | | | | | |
| Yes | 18 | 24 | 25 | 26 | 34 | 24 |
| No | 82 | 76 | 75 | 74 | 66 | 76 |
| Don't know (n = 24) | | | | | | |
| **Q40. Are you interested in receiving any information on GHGs from the government?** | | | | | | |
| Yes | 66 | 70 | 72 | 79 | 76 | 71 |
| No | 34 | 30 | 28 | 21 | 24 | 29 |
| Don't know (n = 20) | | | | | | |
| **Q41. Are you interested in seminar or training courses on farming practices to help reduce GHGs?** | | | | | | |
| Yes | 42 | 51 | 59 | 62 | 59 | 53 |
| No | 58 | 49 | 41 | 38 | 41 | 47 |
| Don't know (n=63) | | | | | | |

## Table A2: Farm business management practices

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q5. In the last 2 years, how often have you . . .** | | | | | | | | |
| **Hired custom services like spraying, custom harvesting, custom feeding, etc?** | | | | | | | | |
| Not in past 2 years | 46 | 30 | 42 | 26 | 32 | 33 | 60 | 35 |
| Once in past 2 years | 5 | 5 | 8 | 11 | 4 | 2 | 2 | 5 |
| Once a year | 15 | 28 | 27 | 21 | 23 | 20 | 17 | 23 |
| Several times per year | 34 | 38 | 23 | 41 | 41 | 45 | 21 | 37 |
| Don't know/refused (n = 8) | | | | | | | | |
| **Made use of resource people like extension specialists?** | | | | | | | | |
| Not in past 2 years | 48 | 36 | 30 | 42 | 50 | 15 | 26 | 36 |
| Once in past 2 years | 5 | 10 | 8 | 8 | 8 | 4 | 5 | 7 |
| Once a year | 12 | 19 | 21 | 15 | 16 | 16 | 17 | 17 |
| Several times per year | 34 | 35 | 41 | 35 | 26 | 65 | 52 | 40 |
| Don't know/refused (n = 21) | | | | | | | | |
| **Attended seminars or taken training courses or home study courses?** | | | | | | | | |
| Not in past 2 years | 52 | 52 | 52 | 58 | 44 | 53 | 46 | 51 |
| Once in past 2 years | 7 | 7 | 11 | 5 | 12 | 7 | 7 | 9 |
| Once a year | 13 | 17 | 20 | 18 | 20 | 15 | 19 | 18 |
| Several times per year | 28 | 24 | 17 | 19 | 24 | 25 | 28 | 23 |
| Don't know/refused (n = 6) | | | | | | | | |
| **Locked in prices for commodities that you produce?** | | | | | | | | |
| Not in past 2 years | 72 | 60 | 48 | 53 | 64 | 52 | 76 | 59 |
| Once in past 2 years | 2 | 7 | 8 | 10 | 7 | 3 | 4 | 6 |
| Once a year | 12 | 12 | 18 | 13 | 13 | 10 | 8 | 12 |
| Several times per year | 14 | 20 | 25 | 24 | 16 | 36 | 12 | 22 |
| Don't know/refused (n = 65) | | | | | | | | |
| **Q5b. Using a 5-point scale, where 1=Strongly agree and 5=Strongly disagree, how much do you agree or disagree with the following statements:** | | | | | | | | |
| **Managing risk associated with uncertainty is my responsibility.** | | | | | | | | |
| (1) - Strongly agree | 46 | 39 | 40 | 37 | 34 | 24 | 36 | 35 |
| (2) | 21 | 25 | 25 | 32 | 23 | 23 | 22 | 25 |
| (3) | 20 | 21 | 23 | 21 | 31 | 35 | 29 | 27 |
| (4) | 7 | 8 | 5 | 5 | 6 | 8 | 8 | 6 |
| (5) - Strongly disagree | 6 | 8 | 7 | 5 | 6 | 10 | 6 | 7 |
| Don't know/refused (n = 46) | | | | | | | | |
| **Reinvesting in my farm make more sense than making non-farm investments.** | | | | | | | | |
| (1) - Strongly agree | 25 | 27 | 22 | 25 | 29 | 58 | 26 | 32 |
| (2) | 20 | 20 | 19 | 21 | 19 | 17 | 18 | 19 |
| (3) | 31 | 30 | 25 | 30 | 27 | 12 | 27 | 25 |
| (4) | 13 | 11 | 15 | 10 | 12 | 5 | 11 | 11 |
| (5) - Strongly disagree | 11 | 12 | 19 | 14 | 13 | 7 | 18 | 13 |
| Don't know/refused (n = 30) | | | | | | | | |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **I plan to make important changes in the way I market the commodities I produce.** | | | | | | | | |
| (1) - Strongly agree | 13 | 13 | 9 | 15 | 11 | 16 | 13 | 13 |
| (2) | 17 | 26 | 24 | 22 | 20 | 13 | 17 | 20 |
| (3) | 21 | 27 | 35 | 25 | 24 | 23 | 23 | 26 |
| (4) | 18 | 19 | 17 | 21 | 19 | 16 | 19 | 18 |
| (5) - Strongly disagree | 31 | 15 | 14 | 18 | 26 | 32 | 28 | 23 |
| Don't know/refused (n = 49) | | | | | | | | |
| **I am always the first one in my area to try new technology and new products** | | | | | | | | |
| (1) - Strongly agree | 9 | 4 | 5 | 7 | 7 | 9 | 7 | 7 |
| (2) | 19 | 22 | 15 | 18 | 21 | 20 | 22 | 20 |
| (3) | 39 | 32 | 36 | 38 | 31 | 39 | 38 | 35 |
| (4) | 15 | 25 | 23 | 18 | 20 | 14 | 17 | 19 |
| (5) - Strongly disagree | 18 | 17 | 20 | 19 | 22 | 19 | 16 | 19 |
| Don't know/refused (n = 13) | | | | | | | | |

## Table A2: Farm business management practices

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q5. In the last 2 years, how often have you . . .** | | | | | | |
| **Hired custom services like spraying, custom harvesting, custom feeding, etc.** | | | | | | |
| Not in past 2 years | 30 | 27 | 50 | 42 | 32 | 35 |
| Once in past 2 years | 6 | 2 | 6 | 7 | 3 | 5 |
| Once a year | 27 | 21 | 12 | 24 | 20 | 23 |
| Several times per year | 36 | 50 | 32 | 27 | 45 | 37 |
| Don't know/refused (n = 8) | | | | | | |
| **Made use of resource people like extension specialists.** | | | | | | |
| Not in past 2 years | 38 | 26 | 34 | 47 | 23 | 36 |
| Once in past 2 years | 7 | 6 | 6 | 8 | 8 | 7 |
| Once a year | 16 | 18 | 11 | 20 | 15 | 17 |
| Several times per year | 39 | 50 | 49 | 25 | 54 | 40 |
| Don't know/refused (n = 21) | | | | | | |
| **Attended seminars or taken training courses or home study courses.** | | | | | | |
| Not in past 2 years | 50 | 46 | 39 | 61 | 42 | 51 |
| Once in past 2 years | 7 | 10 | 10 | 9 | 8 | 9 |
| Once a year | 21 | 17 | 17 | 14 | 19 | 18 |
| Several times per year | 22 | 27 | 34 | 15 | 30 | 23 |
| Don't know/refused (n = 6) | | | | | | |
| **Locked in prices for commodities you produce.** | | | | | | |
| Not in past 2 years | 45 | 65 | 57 | 75 | 52 | 59 |
| Once in past 2 years | 9 | 4 | 2 | 5 | 9 | 6 |
| Once a year | 17 | 10 | 9 | 10 | 12 | 12 |
| Several times per year | 29 | 21 | 32 | 10 | 27 | 22 |
| Don't know/refused (n = 65) | | | | | | |
| **Q5b. Using a 5-point scale, where 1=Strongly agree and 5=Strongly disagree, how much do you agree or disagree with the following statements:** | | | | | | |
| **Managing risk associated with uncertainty is my responsibility.** | | | | | | |
| (1) - Strongly agree | 39 | 29 | 43 | 35 | 30 | 35 |
| (2) | 26 | 24 | 18 | 26 | 22 | 25 |
| (3) | 24 | 32 | 19 | 26 | 32 | 27 |
| (4) | 6 | 8 | 7 | 6 | 7 | 6 |
| (5) - Strongly disagree | 6 | 7 | 12 | 7 | 9 | 7 |
| Don't know/refused (n = 46) | | | | | | |
| **Reinvesting in my farm makes more sense than making non-farm investments.** | | | | | | |
| (1) - Strongly agree | 21 | 46 | 36 | 31 | 37 | 32 |
| (2) | 19 | 21 | 23 | 17 | 18 | 19 |
| (3) | 29 | 21 | 25 | 26 | 21 | 25 |
| (4) | 14 | 7 | 8 | 11 | 10 | 11 |
| (5) - Strongly disagree | 17 | 6 | 8 | 15 | 14 | 13 |
| Don't know/refused (n = 30) | | | | | | |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **I plan to make important changes in the way I market the commodities that I produce.** | | | | | | |
| (1) - Strongly agree | 16 | 9 | 14 | 12 | 13 | 13 |
| (2) | 23 | 14 | 14 | 22 | 21 | 20 |
| (3) | 27 | 24 | 24 | 26 | 25 | 26 |
| (4) | 19 | 18 | 19 | 18 | 19 | 18 |
| (5) - Strongly disagree | 15 | 34 | 29 | 22 | 23 | 23 |
| Don't know/refused (n = 49) | | | | | | |
| **I am always the first one in my area to try new technology and new products.** | | | | | | |
| (1) - Strongly agree | 7 | 7 | 16 | 4 | 3 | 7 |
| (2) | 23 | 19 | 24 | 17 | 16 | 20 |
| (3) | 34 | 44 | 28 | 32 | 37 | 35 |
| (4) | 19 | 16 | 19 | 20 | 23 | 19 |
| (5) - Strongly disagree | 16 | 14 | 13 | 26 | 21 | 19 |
| Don't know/refused (n = 13) | | | | | | |

## Table A2: Farm business management practices

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | 250,000 to 499,999 | 500, 000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q5. In the last 2 years, how often have you . . .** | | | | | | |
| **Hired custom services like spraying, custom harvesting, custom feeding, etc.** | | | | | | |
| Not in past 2 years | 46 | 36 | 30 | 24 | 37 | 35 |
| Once in past 2 years | 9 | 5 | 3 | 6 | 2 | 5 |
| Once a year | 26 | 21 | 25 | 17 | 18 | 23 |
| Several times per year | 19 | 39 | 42 | 54 | 43 | 37 |
| Don't know/refused (n = 8) | | | | | | |
| **Made use of resource people like extension specialists?** | | | | | | |
| Not in past 2 years | 57 | 36 | 27 | 25 | 21 | 36 |
| Once in past 2 years | 9 | 8 | 8 | 6 | 4 | 7 |
| Once a year | 14 | 22 | 20 | 14 | 14 | 17 |
| Several times per year | 20 | 34 | 45 | 54 | 61 | 40 |
| Don't know/refused (n = 21) | | | | | | |
| **Attended seminars and taken training courses or home study courses?** | | | | | | |
| Not in past 2 years | 72 | 52 | 44 | 37 | 34 | 50 |
| Once in past 2 years | 6 | 12 | 9 | 12 | 6 | 9 |
| Once a year | 13 | 20 | 20 | 17 | 22 | 18 |
| Several times per year | 9 | 15 | 28 | 34 | 39 | 23 |
| Don't know/refused (n = 6) | | | | | | |
| **Locked in prices for commodities you produce?** | | | | | | |
| Not in past 2 years | 75 | 63 | 50 | 49 | 48 | 58 |
| Once in past 2 years | 6 | 8 | 6 | 6 | 5 | 6 |
| Once a year | 9 | 12 | 17 | 13 | 10 | 13 |
| Several times per year | 9 | 18 | 27 | 32 | 37 | 23 |
| Don't know/refused (n = 65) | | | | | | |
| **Q5b. Using a 5-point scale, where 1=Strongly agree and 5=Strongly disagree, how much do you agree or disagree with the following statements:** | | | | | | |
| **Managing risk associated with uncertainty is my responsibility.** | | | | | | |
| (1) - Strongly agree | 31 | 38 | 32 | 40 | 41 | 35 |
| (2) | 25 | 28 | 25 | 23 | 21 | 25 |
| (3) | 30 | 24 | 28 | 22 | 22 | 26 |
| (4) | 7 | 6 | 6 | 8 | 5 | 6 |
| (5) - Strongly disagree | 7 | 4 | 8 | 6 | 11 | 7 |
| Don't know/refused (n = 46) | | | | | | |
| **Reinvesting in my farm make more sense than making non-farm investments.** | | | | | | |
| (1) - Strongly agree | 26 | 29 | 33 | 35 | 40 | 32 |
| (2) | 17 | 20 | 21 | 16 | 19 | 19 |
| (3) | 25 | 22 | 25 | 29 | 27 | 25 |
| (4) | 13 | 14 | 10 | 10 | 5 | 11 |
| (5) - Strongly disagree | 18 | 15 | 10 | 10 | 9 | 13 |
| Don't know/refused (n = 30) | | | | | | |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | 250,000 to 499,999 | 500, 000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **I plan to make important changes in the way I market the commodities that I produce.** | | | | | | |
| (1) - Strongly agree | 12 | 12 | 13 | 13 | 14 | 13 |
| (2) | 18 | 25 | 20 | 20 | 20 | 20 |
| (3) | 26 | 25 | 29 | 26 | 22 | 26 |
| (4) | 18 | 18 | 18 | 19 | 19 | 18 |
| (5) - Strongly disagree | 27 | 20 | 20 | 22 | 25 | 23 |
| Don't know/refused (n = 49) | | | | | | |
| **I am always the first one in my area to try a new technology and new products.** | | | | | | |
| (1) - Strongly agree | 7 | 4 | 4 | 6 | 14 | 6 |
| (2) | 15 | 17 | 20 | 24 | 29 | 20 |
| (3) | 27 | 35 | 39 | 45 | 34 | 35 |
| (4) | 20 | 21 | 21 | 16 | 18 | 20 |
| (5) - Strongly disagree | 30 | 23 | 16 | 9 | 5 | 19 |
| Don't know/refused (n = 13) | | | | | | |

## Table A3: Awareness of climate change and GHG issues

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q26. Most significant impact of agriculture on environment** | | | | | | | | |
| Climate change | 25 | 23 | 19 | 22 | 19 | 32 | 22 | 23 |
| Soil erosion | 26 | 34 | 34 | 32 | 41 | 56 | 47 | 40 |
| Water pollution | 41 | 39 | 37 | 52 | 58 | 71 | 53 | 52 |
| Loss of wildlife habitat | 10 | 17 | 18 | 18 | 14 | 22 | 15 | 17 |
| Odour | 12 | 13 | 7 | 16 | 11 | 28 | 17 | 15 |
| None | 13 | 8 | 5 | 5 | 3 | 3 | 3 | 5 |
| Air pollution | 6 | 1 | 5 | 3 | 4 | 0.3 | 1 | 3 |
| Chemicals | 3 | 3 | 10 | 6 | 2 | 0 | 5 | 4 |
| Other | 9 | 12 | 12 | 8 | 10 | 1 | 11 | 9 |
| Don't know | 5 | 6 | 7 | 7 | 7 | 4 | 6 | 6 |
| **Q27a. Level of impact of agriculture on climate change** | | | | | | | | |
| Very important | 25 | 25 | 24 | 22 | 33 | 27 | 24 | 27 |
| Moderately important | 22 | 21 | 27 | 27 | 21 | 24 | 24 | 23 |
| Somewhat important | 21 | 29 | 22 | 29 | 26 | 31 | 33 | 27 |
| Not at all important | 30 | 25 | 21 | 18 | 16 | 18 | 16 | 20 |
| Don't know | 3 | 2 | 5 | 3 | 4 | 0 | 4 | 3 |
| **Q27b. Level of impact of agriculture on GHGs** | | | | | | | | |
| Very important | 14 | 8 | 11 | 12 | 17 | 14 | 6 | 13 |
| Moderately important | 19 | 22 | 26 | 26 | 23 | 32 | 26 | 25 |
| Somewhat important | 29 | 36 | 35 | 35 | 32 | 33 | 40 | 34 |
| Not at all important | 27 | 25 | 21 | 21 | 17 | 17 | 20 | 20 |
| Don't know | 12 | 8 | 8 | 6 | 10 | 3 | 7 | 8 |
| **Q42. What do you think the impact of climate change will be on Canadian agriculture? (n= 1322)** | | | | | | | | |
| Positive | 25 | 24 | 23 | 30 | 28 | 47 | 20 | 30 |
| Negative | 30 | 27 | 26 | 25 | 25 | 23 | 33 | 26 |
| Neutral | 32 | 39 | 37 | 37 | 36 | 23 | 32 | 34 |
| Don't know | 13 | 10 | 14 | 8 | 10 | 8 | 16 | 11 |
| **Q43. Do you believe climate change will result in these environmental impacts?(n = 734)** | | | | | | | | |
| **Extreme weather** | | | | | | | | |
| Yes | 72 | 79 | 87 | 83 | 83 | 65 | 92 | 79 |
| No | 18 | 14 | 8 | 15 | 12 | 28 | 4 | 16 |
| Don't know | 10 | 7 | 5 | 2 | 6 | 7 | 4 | 5 |
| **Dryer season** | | | | | | | | |
| Yes | 74 | 80 | 74 | 72 | 74 | 69 | 92 | 75 |
| No | 10 | 12 | 19 | 19 | 16 | 23 | 2 | 17 |
| Don't know | 15 | 7 | 7 | 9 | 10 | 8 | 6 | 8 |
| **More flooding** | | | | | | | | |
| Yes | 59 | 64 | 72 | 70 | 75 | 70 | 81 | 70 |
| No | 21 | 28 | 19 | 20 | 14 | 23 | 10 | 20 |
| Don't know | 21 | 7 | 9 | 10 | 12 | 7 | 8 | 10 |
| **More drought** | | | | | | | | |
| Yes | 72 | 79 | 77 | 76 | 78 | 68 | 92 | 76 |
| No | 13 | 12 | 17 | 16 | 12 | 22 | 6 | 15 |
| Don't know | 15 | 8 | 6 | 8 | 11 | 9 | 2 | 9 |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Increased pests** | | | | | | | | |
| Yes | 72 | 69 | 67 | 71 | 62 | 67 | 75 | 67 |
| No | 8 | 21 | 16 | 19 | 25 | 23 | 15 | 21 |
| Don't know | 21 | 10 | 16 | 10 | 13 | 10 | 10 | 12 |
| **Save heating costs** | | | | | | | | |
| Yes | 54 | 55 | 56 | 58 | 48 | 50 | 60 | 53 |
| No | 26 | 34 | 33 | 32 | 43 | 41 | 31 | 37 |
| Don't know | 21 | 11 | 12 | 10 | 8 | 9 | 8 | 10 |
| **Introduction of new crop varieties** | | | | | | | | |
| Yes | 82 | 75 | 94 | 81 | 83 | 80 | 85 | 82 |
| No | 5 | 19 | 5 | 14 | 11 | 13 | 8 | 12 |
| Don't know | 13 | 7 | 1 | 5 | 6 | 7 | 6 | 6 |
| **Expansion of planted area** | | | | | | | | |
| Yes | 41 | 44 | 51 | 43 | 55 | 53 | 46 | 50 |
| No | 28 | 46 | 41 | 52 | 34 | 39 | 33 | 40 |
| Don't know | 31 | 10 | 8 | 5 | 11 | 8 | 21 | 10 |
| **Longer growing season** | | | | | | | | |
| Yes | 67 | 68 | 80 | 73 | 73 | 73 | 65 | 72 |
| No | 15 | 22 | 15 | 20 | 20 | 24 | 25 | 21 |
| Don't know | 18 | 9 | 5 | 7 | 7 | 3 | 10 | 7 |
| **Q28. Indicate if you agree, disagree or don't know:** | | | | | | | | |
| **Climate change is caused by human activities** | | | | | | | | |
| Agree | 51 | 49 | 68 | 61 | 61 | 66 | 66 | 60 |
| Disagree | 25 | 27 | 16 | 19 | 17 | 15 | 12 | 19 |
| Don't know | 24 | 25 | 16 | 20 | 22 | 20 | 22 | 21 |
| **Kyoto protocol brought together countries to reduce GHGs** | | | | | | | | |
| Agree | 37 | 45 | 47 | 48 | 44 | 49 | 42 | 45 |
| Disagree | 14 | 13 | 8 | 6 | 8 | 4 | 7 | 9 |
| Don't know | 50 | 42 | 45 | 46 | 48 | 47 | 50 | 46 |
| **Agriculture contributes 10% of Canada's total GHG** | | | | | | | | |
| Agree | 19 | 22 | 25 | 25 | 24 | 28 | 26 | 25 |
| Disagree | 40 | 40 | 31 | 31 | 25 | 26 | 22 | 30 |
| Don't know | 42 | 38 | 43 | 44 | 50 | 47 | 52 | 45 |
| **Carbon dioxide is agriculture's major GHG** | | | | | | | | |
| Agree | 23 | 31 | 41 | 32 | 31 | 30 | 29 | 32 |
| Disagree | 41 | 28 | 26 | 23 | 29 | 23 | 28 | 27 |
| Don't know | 37 | 41 | 34 | 45 | 40 | 47 | 43 | 41 |
| **Q29. Variety of farming practices and their impact on climate change (n= 1322)** | | | | | | | | |
| **Using conservation tillage (reduced/no tillage)** | | | | | | | | |
| Increase | 13 | 18 | 22 | 23 | 22 | 10 | 13 | 18 |
| Decrease | 35 | 44 | 49 | 42 | 40 | 35 | 46 | 41 |
| No impact | 38 | 27 | 20 | 27 | 25 | 45 | 26 | 30 |
| Don't know | 14 | 11 | 10 | 9 | 13 | 11 | 15 | 11 |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Summerfallow** | | | | | | | | |
| Increase | 18 | 39 | 48 | 45 | 29 | 9 | 14 | 30 |
| Decrease | 14 | 16 | 14 | 14 | 13 | 21 | 15 | 16 |
| No impact | 49 | 34 | 30 | 32 | 38 | 51 | 48 | 39 |
| Don't know | 18 | 11 | 8 | 9 | 20 | 19 | 23 | 15 |
| **Growing shelter belts** | | | | | | | | |
| Increase | 17 | 31 | 27 | 28 | 27 | 16 | 24 | 25 |
| Decrease | 37 | 48 | 52 | 48 | 44 | 45 | 36 | 45 |
| No impact | 34 | 13 | 15 | 20 | 19 | 32 | 21 | 21 |
| Don't know | 13 | 8 | 6 | 4 | 10 | 7 | 20 | 9 |
| **Allowing free range grazing (intensive grazing system)** | | | | | | | | |
| Increase | 7 | 14 | 13 | 15 | 16 | 23 | 15 | 16 |
| Decrease | 10 | 18 | 18 | 16 | 20 | 9 | 13 | 16 |
| No impact | 63 | 58 | 53 | 54 | 46 | 55 | 57 | 53 |
| Don't know | 20 | 10 | 16 | 14 | 18 | 13 | 15 | 15 |
| **Growing more forage and grass** | | | | | | | | |
| Increase | 21 | 22 | 24 | 25 | 19 | 17 | 18 | 21 |
| Decrease | 39 | 44 | 52 | 46 | 43 | 24 | 38 | 41 |
| No impact | 34 | 24 | 19 | 23 | 25 | 50 | 32 | 29 |
| Don't know | 6 | 10 | 5 | 7 | 12 | 9 | 12 | 9 |
| **Increased use of inorganic fertilizer** | | | | | | | | |
| Increase | 27 | 33 | 34 | 36 | 34 | 42 | 45 | 36 |
| Decrease | 11 | 19 | 16 | 20 | 13 | 11 | 17 | 15 |
| No impact | 28 | 31 | 31 | 34 | 34 | 37 | 24 | 33 |
| Don't know | 34 | 16 | 20 | 10 | 19 | 11 | 14 | 16 |
| **Q31b. Are you familiar with carbon sequestration or carbon sink farming practices that reduce GHGs?** | | | | | | | | |
| Yes | 11 | 17 | 22 | 19 | 19 | 8 | 9 | 16 |
| No | 89 | 83 | 78 | 81 | 81 | 92 | 91 | 84 |
| Don't know (n = 13) | | | | | | | | |
| **Q36. Are you familiar with an emissions trading market?** | | | | | | | | |
| Yes | 17 | 21 | 18 | 14 | 18 | 9 | 14 | 16 |
| No | 83 | 79 | 82 | 86 | 82 | 91 | 86 | 84 |
| Don't know (n = 6) | | | | | | | | |
| **Q30. Indicate if you agree, disagree or don't know:** | | | | | | | | |
| **The current focus on global warming is overdone** | | | | | | | | |
| Agree | 60 | 67 | 59 | 67 | 55 | 53 | 40 | 58 |
| Disagree | 33 | 22 | 32 | 23 | 34 | 40 | 45 | 32 |
| Don't know | 7 | 10 | 9 | 9 | 10 | 7 | 15 | 10 |
| **Farmers must take responsibility for reducing GHGs** | | | | | | | | |
| Agree | 61 | 50 | 53 | 57 | 64 | 63 | 68 | 59 |
| Disagree | 31 | 40 | 39 | 38 | 30 | 32 | 28 | 34 |
| Don't know | 8 | 10 | 8 | 5 | 7 | 4 | 4 | 7 |
| **Canada should commit itself to reducing GHGs** | | | | | | | | |
| Agree | 80 | 76 | 84 | 80 | 85 | 91 | 89 | 84 |
| Disagree | 13 | 14 | 8 | 14 | 10 | 7 | 5 | 10 |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| Don't know | 7 | 10 | 8 | 6 | 5 | 2 | 6 | 6 |
| **Canadian agriculture should commit itself to reducing GHGs** | | | | | | | | |
| Agree | 62 | 57 | 61 | 59 | 67 | 79 | 74 | 66 |
| Disagree | 28 | 35 | 29 | 34 | 27 | 17 | 21 | 27 |
| Don't know | 10 | 8 | 9 | 7 | 7 | 5 | 5 | 7 |
| **Farming is too much of a struggle to allow climate change issues on the farm to be a priority** | | | | | | | | |
| Agree | 59 | 62 | 63 | 63 | 57 | 64 | 48 | 60 |
| Disagree | 35 | 32 | 33 | 33 | 37 | 31 | 47 | 35 |
| Don't know | 6 | 6 | 4 | 4 | 7 | 5 | 6 | 5 |

## Table A3: Awareness of climate change and GHG issues

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q26. Most significant impact of agriculture on environment.** | | | | | | |
| Climate change | 19 | 25 | 21 | 24 | 28 | 23 |
| Soil erosion | 42 | 45 | 34 | 34 | 45 | 40 |
| Water pollution | 44 | 58 | 54 | 48 | 67 | 52 |
| Loss of wildlife habitat | 13 | 15 | 16 | 20 | 21 | 17 |
| Odour | 11 | 18 | 14 | 12 | 26 | 15 |
| None | 5 | 5 | 8 | 5 | 3 | 5 |
| Air pollution | 3 | 2 | 4 | 3 | 2 | 3 |
| Chemicals | 6 | 2 | 1 | 5 | 0.4 | 4 |
| Other | 11 | 6 | 10 | 8 | 9 | 9 |
| Don't know | 6 | 6 | 6 | 6 | 5 | 6 |
| **Q27a. Level of impact of agriculture on climate change** | | | | | | |
| Very important | 26 | 27 | 30 | 28 | 24 | 27 |
| Moderately important | 24 | 23 | 20 | 25 | 21 | 23 |
| Somewhat important | 27 | 31 | 25 | 23 | 33 | 27 |
| Not at all important | 20 | 18 | 19 | 20 | 20 | 20 |
| Don't know | 3 | 1 | 5 | 3 | 2 | 3 |
| **Q27b. Level of impact of agriculture on GHGs.** | | | | | | |
| Very important | 14 | 9 | 14 | 12 | 13 | 13 |
| Moderately important | 26 | 25 | 29 | 24 | 24 | 25 |
| Somewhat important | 34 | 39 | 26 | 32 | 38 | 34 |
| Not at all important | 20 | 18 | 18 | 22 | 21 | 20 |
| Don't know | 7 | 8 | 12 | 9 | 5 | 8 |
| **Q42. What do you think the impact of climate change will be on Canadian agriculture? (n= 1322)** | | | | | | |
| Positive | 28 | 30 | 36 | 26 | 35 | 30 |
| Negative | 30 | 25 | 21 | 25 | 23 | 26 |
| Neutral | 31 | 37 | 31 | 36 | 32 | 34 |
| Don't know | 11 | 7 | 11 | 12 | 11 | 11 |
| **Q43. Do you believe climate change will result in these environmental impacts? (n = 734)** | | | | | | |
| **Extreme weather** | | | | | | |
| Yes | 85 | 70 | 81 | 82 | 68 | 79 |
| No | 11 | 24 | 15 | 13 | 20 | 16 |
| Don't know | 4 | 5 | 4 | 5 | 12 | 5 |
| **Dryer season** | | | | | | |
| Yes | 74 | 72 | 74 | 84 | 65 | 75 |
| No | 17 | 20 | 15 | 12 | 23 | 17 |
| Don't know | 10 | 8 | 12 | 5 | 12 | 8 |
| **More flooding** | | | | | | |
| Yes | 72 | 69 | 65 | 75 | 67 | 70 |
| No | 18 | 22 | 24 | 17 | 21 | 20 |
| Don't know | 10 | 8 | 12 | 8 | 12 | 10 |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **More drought** | | | | | | |
| Yes | 79 | 68 | 76 | 83 | 68 | 76 |
| No | 12 | 24 | 15 | 10 | 20 | 15 |
| Don't know | 9 | 8 | 9 | 7 | 12 | 9 |
| **Increased pests** | | | | | | |
| Yes | 71 | 64 | 62 | 70 | 63 | 67 |
| No | 20 | 24 | 21 | 17 | 25 | 21 |
| Don't know | 10 | 11 | 18 | 14 | 12 | 12 |
| **Save heating costs** | | | | | | |
| Yes | 56 | 52 | 59 | 54 | 40 | 53 |
| No | 31 | 40 | 29 | 37 | 50 | 37 |
| Don't know | 12 | 8 | 12 | 9 | 9 | 10 |
| **Introduction of new crop varieties** | | | | | | |
| Yes | 83 | 84 | 84 | 82 | 78 | 82 |
| No | 11 | 11 | 7 | 14 | 14 | 12 |
| Don't know | 6 | 5 | 9 | 4 | 8 | 6 |
| **Expansion of planted area** | | | | | | |
| Yes | 46 | 57 | 54 | 49 | 46 | 50 |
| No | 45 | 34 | 29 | 39 | 41 | 40 |
| Don't know | 9 | 8 | 16 | 12 | 13 | 10 |
| **Longer growing season** | | | | | | |
| Yes | 75 | 71 | 84 | 67 | 71 | 72 |
| No | 18 | 22 | 7 | 26 | 23 | 21 |
| Don't know | 7 | 7 | 9 | 7 | 6 | 7 |
| **Q28. Indicate if you agree, disagree or don't know:** | | | | | | |
| **Climate change is caused by human activities** | | | | | | |
| Agree | 63 | 57 | 62 | 58 | 63 | 60 |
| Disagree | 16 | 22 | 20 | 19 | 18 | 19 |
| Don't know | 21 | 21 | 18 | 23 | 19 | 21 |
| **Kyoto protocol brought countries together to reduce GHGs** | | | | | | |
| Agree | 49 | 40 | 51 | 40 | 50 | 45 |
| Disagree | 8 | 10 | 7 | 9 | 6 | 9 |
| Don't know | 43 | 50 | 42 | 51 | 43 | 46 |
| **Agriculture contributes 10% of Canada's total GHGs** | | | | | | |
| Agree | 25 | 25 | 23 | 23 | 27 | 25 |
| Disagree | 32 | 28 | 27 | 34 | 22 | 30 |
| Don't know | 43 | 47 | 49 | 43 | 50 | 45 |
| **Carbon dioxide is agriculture's major GHG** | | | | | | |
| Agree | 33 | 27 | 26 | 32 | 38 | 32 |
| Disagree | 27 | 35 | 27 | 28 | 18 | 27 |
| Don't know | 40 | 38 | 47 | 40 | 44 | 41 |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q29. Variety of farming practices and their impact on climate change (n= 1322)** | | | | | | |
| **Using conservation tillage (reduced/no tillage)** | | | | | | |
| Increase | 17 | 16 | 13 | 24 | 16 | 18 |
| Decrease | 47 | 37 | 38 | 36 | 47 | 41 |
| No impact | 26 | 38 | 29 | 26 | 31 | 30 |
| Don't know | 10 | 9 | 20 | 14 | 6 | 11 |
| **Summerfallow** | | | | | | |
| Increase | 42 | 22 | 22 | 32 | 17 | 30 |
| Decrease | 13 | 16 | 15 | 16 | 19 | 16 |
| No impact | 32 | 49 | 37 | 39 | 44 | 39 |
| Don't know | 13 | 14 | 25 | 13 | 20 | 15 |
| **Growing shelter belts** | | | | | | |
| Increase | 24 | 27 | 19 | 30 | 17 | 25 |
| Decrease | 50 | 38 | 43 | 44 | 50 | 45 |
| No impact | 18 | 28 | 26 | 17 | 23 | 21 |
| Don't know | 8 | 8 | 12 | 9 | 9 | 9 |
| **Allowing free range grazing (intensive grazing system)** | | | | | | |
| Increase | 14 | 15 | 14 | 17 | 22 | 16 |
| Decrease | 20 | 17 | 9 | 15 | 11 | 16 |
| No impact | 49 | 55 | 57 | 56 | 51 | 53 |
| Don't know | 17 | 13 | 20 | 12 | 16 | 15 |
| **Growing more forage and grass** | | | | | | |
| Increase | 19 | 22 | 19 | 25 | 16 | 21 |
| Decrease | 51 | 31 | 34 | 39 | 39 | 41 |
| No impact | 23 | 38 | 31 | 26 | 37 | 29 |
| Don't know | 6 | 9 | 16 | 10 | 8 | 9 |
| **Increased use of inorganic fertilizer** | | | | | | |
| Increase | 35 | 34 | 37 | 36 | 41 | 36 |
| Decrease | 18 | 12 | 12 | 17 | 10 | 15 |
| No impact | 29 | 41 | 30 | 32 | 34 | 33 |
| Don't know | 18 | 13 | 21 | 16 | 15 | 16 |
| **Q31b. Are you familiar with carbon sequestration or carbon sink farming practices that reduce GHGs?** | | | | | | |
| Yes | 22 | 12 | 13 | 13 | 17 | 16 |
| No | 78 | 88 | 87 | 87 | 83 | 84 |
| Don't know (n = 13) | | | | | | |
| **Q36. Are you familiar with an emissions trading market?** | | | | | | |
| Yes | 20 | 15 | 21 | 12 | 15 | 16 |
| No | 80 | 85 | 79 | 88 | 85 | 84 |
| Don't know (n = 6) | | | | | | |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q30. Indicate if you agree, disagree or don't know:** | | | | | | |
| **The current focus on global warming is overdone** | | | | | | |
| Agree | 58 | 54 | 55 | 60 | 61 | 58 |
| Disagree | 32 | 36 | 38 | 29 | 31 | 32 |
| Don't know | 10 | 10 | 6 | 11 | 8 | 10 |
| **Farmers must take responsibility for reducing GHGs** | | | | | | |
| Agree | 61 | 60 | 67 | 53 | 62 | 59 |
| Disagree | 33 | 35 | 27 | 39 | 32 | 34 |
| Don't know | 6 | 6 | 6 | 8 | 6 | 7 |
| **Canada should commit itself to reducing GHGs** | | | | | | |
| Agree | 87 | 85 | 84 | 78 | 87 | 84 |
| Disagree | 9 | 9 | 10 | 13 | 10 | 10 |
| Don't know | 5 | 7 | 6 | 9 | 3 | 6 |
| **Canadian agriculture should commit itself to reducing GHGs** | | | | | | |
| Agree | 66 | 65 | 68 | 61 | 72 | 66 |
| Disagree | 27 | 28 | 24 | 29 | 25 | 27 |
| Don't know | 6 | 7 | 8 | 9 | 4 | 7 |
| **Farming is too much of a struggle to allow climate change issues on the farm to be a priority** | | | | | | |
| Agree | 62 | 60 | 52 | 60 | 63 | 60 |
| Disagree | 34 | 36 | 41 | 35 | 29 | 35 |
| Don't know | 4 | 4 | 7 | 5 | 8 | 5 |

## Table A3: Awareness of climate change and GHG issues

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q26. Most significant impact of agriculture on environment** | | | | | | |
| Climate change | 23 | 23 | 25 | 22 | 23 | 23 |
| Soil erosion | 34 | 40 | 45 | 41 | 43 | 41 |
| Water pollution | 48 | 52 | 54 | 51 | 62 | 52 |
| Loss of wildlife habitat | 16 | 15 | 18 | 15 | 18 | 17 |
| Odour | 11 | 16 | 14 | 19 | 19 | 15 |
| None | 5 | 3 | 6 | 6 | 5 | 5 |
| Air pollution | 4 | 2 | 2 | 4 | 3 | 3 |
| Chemicals | 5 | 6 | 3 | 1 | 1 | 4 |
| Other | 9 | 13 | 7 | 6 | 10 | 9 |
| Don't know | 6 | 6 | 5 | 8 | 5 | 6 |
| **Q27a. Level of impact of agriculture on climate change** | | | | | | |
| Very important | 30 | 28 | 25 | 23 | 23 | 26 |
| Moderately important | 24 | 25 | 26 | 18 | 20 | 23 |
| Somewhat important | 26 | 28 | 28 | 32 | 30 | 28 |
| Not at all important | 18 | 16 | 18 | 24 | 22 | 19 |
| Don't know | 3 | 2 | 3 | 3 | 5 | 3 |
| **Q27b. Level of impact of agriculture on GHGs.** | | | | | | |
| Very important | 12 | 16 | 13 | 10 | 12 | 13 |
| Moderately important | 24 | 26 | 25 | 24 | 26 | 25 |
| Somewhat important | 31 | 32 | 38 | 36 | 34 | 34 |
| Not at all important | 24 | 19 | 17 | 22 | 20 | 20 |
| Don't know | 9 | 7 | 6 | 7 | 8 | 8 |
| **Q42. What do you think the impact of climate change will be on Canadian agriculture? (n = 1322)** | | | | | | |
| Positive | 25 | 29 | 32 | 31 | 40 | 30 |
| Negative | 25 | 29 | 30 | 20 | 22 | 26 |
| Neutral | 37 | 34 | 29 | 41 | 29 | 33 |
| Don't know | 13 | 8 | 9 | 8 | 9 | 10 |
| **Q43. Do you believe climate change will result in these environmental impacts (n = 734)** | | | | | | |
| **Extreme weather** | | | | | | |
| Yes | 87 | 80 | 73 | 78 | 76 | 79 |
| No | 7 | 17 | 19 | 17 | 19 | 16 |
| Don't know | 6 | 3 | 7 | 5 | 5 | 5 |
| **Dryer season** | | | | | | |
| Yes | 80 | 77 | 71 | 71 | 73 | 75 |
| No | 15 | 14 | 20 | 22 | 13 | 17 |
| Don't know | 5 | 9 | 10 | 7 | 14 | 9 |
| **More flooding** | | | | | | |
| Yes | 75 | 79 | 66 | 70 | 63 | 70 |
| No | 14 | 14 | 24 | 25 | 23 | 20 |
| Don't know | 10 | 7 | 10 | 5 | 14 | 10 |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **More drought** | | | | | | |
| Yes | 83 | 80 | 70 | 76 | 75 | 76 |
| No | 9 | 12 | 22 | 14 | 15 | 15 |
| Don't know | 8 | 8 | 8 | 9 | 10 | 9 |
| **Increased pests** | | | | | | |
| Yes | 77 | 65 | 65 | 71 | 53 | 67 |
| No | 11 | 24 | 23 | 18 | 31 | 21 |
| Don't know | 12 | 11 | 12 | 11 | 16 | 12 |
| **Save heating costs** | | | | | | |
| Yes | 61 | 40 | 53 | 63 | 51 | 53 |
| No | 31 | 49 | 34 | 33 | 40 | 37 |
| Don't know | 8 | 11 | 12 | 4 | 10 | 10 |
| **Introduction of new crop varieties** | | | | | | |
| Yes | 78 | 83 | 82 | 95 | 81 | 82 |
| No | 15 | 12 | 13 | 4 | 12 | 12 |
| Don't know | 7 | 5 | 5 | 1 | 7 | 5 |
| **Expansion of planted area** | | | | | | |
| Yes | 48 | 48 | 48 | 61 | 49 | 50 |
| No | 37 | 42 | 43 | 37 | 34 | 40 |
| Don't know | 15 | 9 | 9 | 3 | 16 | 10 |
| **Longer growing season** | | | | | | |
| Yes | 73 | 64 | 73 | 84 | 77 | 72 |
| No | 20 | 29 | 22 | 13 | 14 | 21 |
| Don't know | 7 | 8 | 6 | 3 | 9 | 7 |
| **Q28. Indicate if you agree, disagree or don't know:** | | | | | | |
| **Climate change is caused by human activities** | | | | | | |
| Agree | 60 | 60 | 60 | 62 | 59 | 60 |
| Disagree | 18 | 17 | 18 | 23 | 22 | 19 |
| Don't know | 22 | 23 | 23 | 15 | 19 | 21 |
| **Kyoto protocol brought countries together to reduce GHGs** | | | | | | |
| Agree | 40 | 48 | 45 | 53 | 53 | 46 |
| Disagree | 10 | 9 | 8 | 7 | 6 | 9 |
| Don't know | 50 | 43 | 47 | 40 | 41 | 45 |
| **Agriculture contributes 10% of Canada's total GHGs** | | | | | | |
| Agree | 26 | 27 | 23 | 27 | 23 | 25 |
| Disagree | 32 | 30 | 28 | 28 | 26 | 29 |
| Don't know | 43 | 43 | 49 | 45 | 51 | 46 |
| **Carbon dioxide is agriculture's major GHG** | | | | | | |
| Agree | 31 | 33 | 32 | 32 | 32 | 32 |
| Disagree | 27 | 27 | 25 | 29 | 29 | 27 |
| Don't know | 42 | 40 | 44 | 39 | 39 | 41 |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q29. Variety of farming practices and their impact on climate change (n = 1322)** | | | | | | |
| **Using conservation tillage (reduced/no tillage)** | | | | | | |
| Increase | 17 | 24 | 18 | 14 | 17 | 18 |
| Decrease | 33 | 43 | 44 | 51 | 44 | 41 |
| No impact | 37 | 23 | 29 | 27 | 28 | 30 |
| Don't know | 14 | 10 | 10 | 7 | 11 | 11 |
| **Summerfallow** | | | | | | |
| Increase | 26 | 33 | 35 | 26 | 28 | 30 |
| Decrease | 15 | 15 | 14 | 17 | 17 | 16 |
| No impact | 43 | 39 | 37 | 41 | 36 | 39 |
| Don't know | 16 | 12 | 14 | 17 | 19 | 15 |
| **Growing shelter belts** | | | | | | |
| Increase | 28 | 31 | 24 | 17 | 17 | 25 |
| Decrease | 40 | 42 | 51 | 49 | 47 | 46 |
| No impact | 22 | 18 | 20 | 23 | 29 | 21 |
| Don't know | 10 | 10 | 5 | 11 | 7 | 8 |
| **Allowing free range grazing (intensive grazing system)** | | | | | | |
| Increase | 14 | 19 | 14 | 17 | 20 | 16 |
| Decrease | 16 | 17 | 16 | 15 | 14 | 16 |
| No impact | 56 | 48 | 55 | 53 | 51 | 53 |
| Don't know | 14 | 17 | 15 | 16 | 15 | 15 |
| **Growing more forage and grass** | | | | | | |
| Increase | 21 | 25 | 21 | 16 | 20 | 21 |
| Decrease | 38 | 41 | 46 | 35 | 37 | 41 |
| No impact | 30 | 23 | 26 | 41 | 34 | 29 |
| Don't know | 11 | 10 | 7 | 8 | 9 | 9 |
| **Increased use of inorganic fertilizer** | | | | | | |
| Increase | 36 | 36 | 38 | 32 | 34 | 36 |
| Decrease | 16 | 19 | 13 | 16 | 13 | 15 |
| No impact | 33 | 30 | 32 | 34 | 36 | 33 |
| Don't know | 15 | 15 | 17 | 18 | 16 | 16 |
| **Q31b. Are you familiar with carbon sequestration or carbon sink farming practicesthat reduce GHGs?** | | | | | | |
| Yes | 11 | 15 | 18 | 17 | 26 | 17 |
| No | 89 | 85 | 82 | 83 | 74 | 83 |
| Don't know (n = 13) | | | | | | |
| **Q36. Are you familiar with an emissions trading market?** | | | | | | |
| Yes | 11 | 14 | 18 | 17 | 27 | 16 |
| No | 89 | 86 | 82 | 83 | 73 | 84 |
| Don't know (n = 6) | | | | | | |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q30. Indicate if you agree, disagree or don't know:** | | | | | | |
| **The current focus on global warming is overdone** | | | | | | |
| Agree | 54 | 55 | 62 | 61 | 65 | 59 |
| Disagree | 35 | 36 | 30 | 29 | 29 | 32 |
| Don't know | 11 | 9 | 8 | 10 | 6 | 9 |
| **Farmers must take responsibility for reducing GHGs** | | | | | | |
| Agree | 60 | 60 | 60 | 59 | 61 | 60 |
| Disagree | 34 | 34 | 35 | 32 | 33 | 34 |
| Don't know | 7 | 6 | 5 | 9 | 5 | 6 |
| **Canada should commit itself to reducing GHGs** | | | | | | |
| Agree | 83 | 85 | 84 | 83 | 86 | 84 |
| Disagree | 11 | 8 | 11 | 11 | 12 | 10 |
| Don't know | 6 | 7 | 5 | 6 | 3 | 5 |
| **Canadian agriculture should commit itself to reducing GHGs** | | | | | | |
| Agree | 68 | 67 | 68 | 62 | 65 | 67 |
| Disagree | 27 | 25 | 25 | 31 | 31 | 27 |
| Don't know | 6 | 8 | 7 | 7 | 4 | 6 |
| **Farming is too much of a struggle to allow climate change issues on the farm to be a priority** | | | | | | |
| Agree | 60 | 63 | 61 | 54 | 61 | 60 |
| Disagree | 33 | 33 | 36 | 38 | 32 | 35 |
| Don't know | 7 | 4 | 3 | 8 | 7 | 5 |

## Table A4: Producer's behaviour

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q32a. Willingness to reduce GHGs** | | | | | | | | |
| (1) Not at all willing | 25 | 25 | 16 | 22 | 15 | 11 | 13 | 17 |
| 2 | 11 | 11 | 13 | 12 | 13 | 10 | 15 | 12 |
| 3 | 30 | 37 | 38 | 39 | 36 | 45 | 31 | 38 |
| 4 | 11 | 15 | 18 | 12 | 21 | 16 | 12 | 16 |
| (5) Very willing | 23 | 11 | 15 | 15 | 16 | 18 | 29 | 17 |
| Don't know (n = 94) | | | | | | | | |
| **Q32b. Willingness to reduce GHGs with government help (n = 1133)** | | | | | | | | |
| (1) Not at all willing | 30 | 24 | 20 | 18 | 16 | 9 | 10 | 18 |
| 2 | 5 | 12 | 14 | 15 | 14 | 14 | 16 | 13 |
| 3 | 33 | 31 | 27 | 30 | 28 | 32 | 46 | 31 |
| 4 | 16 | 23 | 28 | 27 | 25 | 28 | 8 | 24 |
| (5) Very willing | 17 | 9 | 11 | 9 | 17 | 17 | 20 | 14 |
| Don't know (n = 70) | | | | | | | | |
| **Q31. Should government help farmers to reduce GHGs? (n = 1309)** | | | | | | | | |
| Yes | 83 | 75 | 81 | 86 | 87 | 94 | 84 | 85 |
| No | 17 | 25 | 19 | 14 | 13 | 6 | 16 | 15 |
| Don't know ( n = 68) | | | | | | | | |
| **Q31a. What type of help or support should producers receive from government to help them reduce GHGs? (n = 1055) (unaided)** | | | | | | | | |
| Financial incentives | 47 | 39 | 44 | 50 | 58 | 47 | 62 | 50 |
| More information | 21 | 29 | 25 | 30 | 29 | 48 | 33 | 32 |
| Training | 16 | 15 | 12 | 11 | 16 | 17 | 25 | 15 |
| Emissions trading | 0 | 1 | 0 | 0 | 0.3 | 1 | 0 | 0.4 |
| Research | 4 | 8 | 5 | 3 | 3 | 19 | 3 | 7 |
| Regulation | 4 | 5 | 5 | 3 | 2 | 4 | 4 | 4 |
| Credit for building soil carbon | 0 | 5 | 4 | 2 | 1 | 3 | 0 | 2 |
| None of the above | 7 | 5 | 8 | 6 | 4 | 1 | 4 | 5 |
| Environmental protection | 4 | 10 | 7 | 4 | 3 | 1 | 1 | 4 |
| Cost effective measure | 2 | 1 | 1 | 0 | 0.3 | 1 | 0 | 1 |
| Don't know (n = 200) | 23 | 23 | 20 | 20 | 18 | 17 | 13 | 19 |
| **Q38. Government initiatives would be more likely to influence farmers in adopting farming practices to reduce GHGs (n = 1309)** | | | | | | | | |
| Technical advice and support in adopting farming practices | 34 | 23 | 36 | 26 | 31 | 28 | 41 | 30 |
| Creating an emissions trading market in Canada | 5 | 16 | 12 | 11 | 8 | 10 | 3 | 10 |
| Investing more on research on agriculture & GHGs | 26 | 25 | 20 | 30 | 28 | 36 | 31 | 28 |
| New regulations to reduce GHGs | 5 | 6 | 5 | 5 | 4 | 5 | 2 | 5 |
| Voluntary programs | 19 | 21 | 20 | 21 | 20 | 12 | 14 | 18 |
| Don't know/ refused | 11 | 8 | 7 | 8 | 9 | 9 | 8 | 8 |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q11/Q11a. Main tillage practices (n = 1383)** | | | | | | | | |
| Conventional tillage | 77 | 57 | 52 | 71 | 63 | 80 | 88 | 66 |
| Reduced tillage | 8 | 26 | 28 | 22 | 15 | 16 | 6 | 20 |
| No till | 15 | 17 | 20 | 8 | 22 | 4 | 5 | 14 |
| Don't know (n = 15) | | | | | | | | |
| **Q11. Kind of tillage (n = 1383)** | | | | | | | | |
| Conventional tillage | 81 | 63 | 60 | 76 | 73 | 82 | 91 | 73 |
| Reduced tillage | 8 | 35 | 36 | 34 | 31 | 25 | 13 | 30 |
| No till | 15 | 22 | 25 | 11 | 37 | 10 | 6 | 22 |
| **Q12. How often do you conduct a soil test for nutrient management on a field? (n = 1409)** | | | | | | | | |
| Never | 16 | 20 | 28 | 26 | 16 | 3 | 15 | 18 |
| Less than once a year | 36 | 39 | 42 | 36 | 55 | 42 | 40 | 44 |
| Yearly | 48 | 41 | 29 | 37 | 29 | 55 | 45 | 38 |
| Don't know (n = 9) | | | | | | | | |
| **Q17. Do you have a shelter belt?** | | | | | | | | |
| Yes | 46 | 81 | 69 | 69 | 58 | 32 | 58 | 60 |
| No | 54 | 19 | 31 | 31 | 42 | 68 | 42 | 41 |
| Don't know (n = 5) | | | | | | | | |
| **Q18. Do you intend to plant a shelter belt?** | | | | | | | | |
| Yes | 16 | 24 | 24 | 28 | 21 | 12 | 9 | 20 |
| No | 84 | 76 | 76 | 72 | 79 | 88 | 91 | 80 |
| Don't know (n = 36) | | | | | | | | |
| **Q18a. Reason for planting a shelter belt (n = 324)** | | | | | | | | |
| Windbreak | 38 | 31 | 30 | 25 | 23 | 47 | 56 | 30 |
| Erosion control | 13 | 22 | 26 | 20 | 53 | 50 | 44 | 33 |
| Snow management | 0 | 9 | 20 | 13 | 3 | 18 | 11 | 11 |
| Renovating aging windbreak/ upgrading | 13 | 20 | 18 | 26 | 21 | 0 | 0 | 18 |
| Personal comfort | 19 | 6 | 2 | 16 | 10 | 21 | 11 | 11 |
| Other | 19 | 37 | 28 | 31 | 26 | 15 | 22 | 28 |
| Don't know (n = 2) | | | | | | | | |
| **Q37a. If an emissions trading market were established at $3/acre (n = 1083)** | | | | | | | | |
| Very interested | 9 | 12 | 11 | 8 | 10 | 11 | 11 | 11 |
| Moderately interested | 22 | 24 | 33 | 26 | 30 | 36 | 26 | 29 |
| Somewhat interested | 31 | 26 | 28 | 34 | 30 | 24 | 34 | 29 |
| Not interested at all | 29 | 33 | 22 | 28 | 25 | 26 | 23 | 27 |
| Don't know | 9 | 5 | 6 | 3 | 4 | 2 | 5 | 4 |
| **Q37ai. If an emissions trading market were established at $6/acre (n = 486)** | | | | | | | | |
| Very interested | 3 | 7 | 17 | 6 | 6 | 11 | 3 | 8 |
| Moderately interested | 33 | 32 | 44 | 45 | 33 | 36 | 35 | 37 |
| Somewhat interested | 23 | 29 | 25 | 30 | 35 | 23 | 29 | 28 |
| Not interested at all | 23 | 26 | 10 | 17 | 22 | 26 | 29 | 21 |
| Don't know | 17 | 7 | 4 | 1 | 4 | 3 | 3 | 5 |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q37b. If an emissions trading market were established at $10/acre (n = 483)** | | | | | | | | |
| Very interested | | 13 | 12 | 16 | 9 | 19 | 13 | 14 |
| Moderately interested | 45 | 32 | 35 | 34 | 42 | 26 | 26 | 34 |
| Somewhat interested | 36 | 23 | 17 | 21 | 21 | 26 | 29 | 23 |
| Not interested at all | 18 | 27 | 22 | 24 | 22 | 24 | 19 | 23 |
| Don't know | | 5 | 14 | 5 | 5 | 4 | 13 | 6 |
| **Q35. What % of the cost should be paid by the producer to adopt environmental farming practices to reduce GHGs?** | | | | | | | | |
| 0% | 38 | 35 | 43 | 35 | 23 | 16 | 26 | 29 |
| 1–4% | 2 | 6 | 5 | 4 | 5 | 4 | 1 | 4 |
| 5–10% | 6 | 11 | 12 | 14 | 12 | 15 | 11 | 12 |
| 11–25% | 12 | 12 | 10 | 14 | 15 | 19 | 13 | 14 |
| 26–50% | 32 | 27 | 25 | 29 | 35 | 37 | 43 | 32 |
| 51–75% | 4 | 3 | 1 | 2 | 4 | 4 | 2 | 3 |
| More than 75% | 6 | 6 | 4 | 2 | 6 | 6 | 3 | 5 |
| Don't know (n = 138) | | | | | | | | |
| **Q8b. Do you have a liquid or solid manure system? (n = 1369)** | | | | | | | | |
| Solid manure system | 49 | 63 | 74 | 73 | 60 | 43 | 72 | 61 |
| Liquid manure system | 19 | 7 | 4 | 11 | 17 | 42 | 11 | 18 |
| Both | 17 | 10 | 1 | 4 | 18 | 13 | 11 | 11 |
| No system | 15 | 20 | 21 | 12 | 5 | 2 | 6 | 10 |
| Don't know (n = 3) | | | | | | | | |
| **Q9a. What type of manure storage system do you use? (n = 1225)** | | | | | | | | |
| Earthen lagoon | 26 | 18 | 2 | 10 | 15 | 5 | 19 | 12 |
| Concrete lagoon | 17 | 3 | 2 | 6 | 8 | 48 | 9 | 16 |
| Bare ground | 29 | 69 | 77 | 66 | 28 | 23 | 32 | 43 |
| Tanks | 10 | 2 | 4 | 3 | 20 | 9 | 7 | 10 |
| Gravel/cement pad | 12 | 1 | 0 | 2 | 40 | 6 | 29 | 15 |
| Other | 13 | 14 | 16 | 17 | 8 | 13 | 12 | 12 |
| Don't know (n = 1) | | | | | | | | |
| **Q13a. Do you apply manure on the land you farm?** | | | | | | | | |
| Yes | 71 | 77 | 69 | 68 | 84 | 86 | 85 | 78 |
| No | 29 | 23 | 31 | 32 | 16 | 14 | 15 | 22 |
| Don't know (n = 4) | | | | | | | | |
| **Q13c. Did you also do a spring application? (n = 807)** | | | | | | | | |
| Yes | 78 | 36 | 21 | 15 | 65 | 64 | 62 | 51 |
| No | 22 | 64 | 79 | 85 | 35 | 36 | 38 | 49 |
| Don't know (n= 2) | | | | | | | | |
| **Q15a. Would you say you rotate the field on which you apply manure . . . (n = 1280)** | | | | | | | | |
| All the time | 61 | 67 | 64 | 67 | 75 | 64 | 57 | 67 |
| Most of the time | 10 | 13 | 21 | 15 | 14 | 19 | 24 | 16 |
| Some of the time | 12 | 14 | 10 | 13 | 8 | 11 | 13 | 11 |
| Never | 17 | 6 | 5 | 5 | 3 | 6 | 7 | 6 |
| Don't know (n = 8) | | | | | | | | |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q15_b. Would you say you spread manure on frozen ground . . . (n = 1280)** | | | | | | | | |
| All the time | 6 | 4 | 4 | 6 | 3 | 0 | 0 | 3 |
| Most of the time | 1 | 3 | 3 | 1 | 1 | 0 | 1 | 2 |
| Some of the time | 10 | 19 | 24 | 19 | 29 | 1 | 24 | 19 |
| Never | 83 | 74 | 69 | 73 | 68 | 99 | 75 | 76 |
| Don't know (n = 3) | | | | | | | | |
| **Q15_c. Would you say you conduct soil test and apply manure accordingly . . . (n= 1280)** | | | | | | | | |
| All the time | 15 | 11 | 5 | 11 | 21 | 50 | 16 | 21 |
| Most of the time | 15 | 7 | 5 | 9 | 15 | 24 | 13 | 13 |
| Some of the time | 17 | 20 | 14 | 17 | 24 | 15 | 26 | 19 |
| Never | 53 | 62 | 75 | 62 | 41 | 11 | 45 | 47 |
| Don't know (n = 8) | | | | | | | | |
| **Q15_d. Would you say you inject liquid manure into the ground . . . (n = 1280)** | | | | | | | | |
| All the time | 0 | 1 | 4 | 5 | 2 | 7 | 2 | 3 |
| Most of the time | 3 | 1 | 1 | 2 | 2 | 6 | 0 | 2 |
| Some of the time | 6 | 4 | 1 | 1 | 5 | 4 | 1 | 4 |
| Never | 92 | 94 | 95 | 93 | 91 | 81 | 97 | 91 |
| Don't know (n = 3) | | | | | | | | |
| **Q15b_a. Would you say you spread solid/liquid manure on top of the ground . . . (n = 1280)** | | | | | | | | |
| All the time | 72 | 79 | 80 | 73 | 69 | 65 | 74 | 72 |
| Most of the time | 10 | 4 | 6 | 11 | 11 | 9 | 16 | 9 |
| Some of the time | 11 | 10 | 7 | 9 | 12 | 11 | 8 | 10 |
| Never | 7 | 7 | 8 | 7 | 8 | 14 | 2 | 9 |
| Don't know (n = 4) | | | | | | | | |
| **Q15b_b. Would you say you incorporate the manure immediately after application . . . (n= 1168)** | | | | | | | | |
| All the time | 36 | 43 | 32 | 39 | 32 | 37 | 26 | 35 |
| Most of the time | 10 | 17 | 15 | 23 | 28 | 29 | 21 | 23 |
| Some of the time | 34 | 23 | 29 | 20 | 27 | 23 | 26 | 25 |
| Never | 20 | 17 | 23 | 17 | 13 | 11 | 28 | 17 |
| Don't know (n = 25) | | | | | | | | |
| **Q15b_c. Would you say you incorporate the manure later in the season . . . (n = 1168)** | | | | | | | | |
| All the time | 16 | 20 | 24 | 13 | 12 | 9 | 8 | 14 |
| Most of the time | 11 | 12 | 15 | 12 | 16 | 8 | 8 | 12 |
| Some of the time | 29 | 28 | 27 | 30 | 36 | 21 | 40 | 30 |
| Never | 44 | 40 | 34 | 45 | 36 | 62 | 44 | 43 |
| Don't know (n = 30) | | | | | | | | |
| **Q16. Would you say you use the same practices on rented land? (n = 654)** | | | | | | | | |
| Yes | 81 | 58 | 66 | 59 | 76 | 84 | 80 | 72 |
| No | 19 | 42 | 34 | 41 | 24 | 16 | 20 | 28 |
| Don't know (n = 7) | | | | | | | | |
| **Q19. Do you have a environmental plan?** | | | | | | | | |
| Yes | 46 | 24 | 25 | 22 | 37 | 59 | 36 | 36 |
| No | 41 | 49 | 52 | 56 | 55 | 38 | 56 | 50 |
| No, but have environmental practices | 12 | 27 | 23 | 22 | 8 | 3 | 7 | 14 |
| Don't know (n = 25) | | | | | | | | |

| Province | BC | AB | SK | MB | ON | QC | ATL | Total |
|---|---|---|---|---|---|---|---|---|
| n= | 101 | 277 | 223 | 222 | 421 | 290 | 109 | 1643 |
| | | | | % | | | | |
| **Q22. Is it a formal plan developed in conjunction with a formal environmental program? (n =1643)** | | | | | | | | |
| Yes | 21 | 7 | 9 | 7 | 30 | 52 | 28 | 23 |
| No | 79 | 93 | 91 | 93 | 70 | 48 | 72 | 77 |
| **Q23. Are you considering a formal plan? (n = 1263)** | | | | | | | | |
| Yes | 14 | 6 | 6 | 8 | 27 | 60 | 29 | 19 |
| Maybe | 3 | 7 | 11 | 15 | 14 | 10 | 13 | 11 |
| No | 84 | 87 | 83 | 77 | 59 | 30 | 58 | 70 |
| Don't know (n = 39) | | | | | | | | |
| **Q20. How many years have you had your plan? (Formal plan n = 380 )** | | | | | | | | |
| 1-5 years | 58 | 65 | 63 | 80 | 80 | 97 | 93 | 85 |
| 6 years and over | 42 | 35 | 38 | 20 | 20 | 3 | 7 | 15 |
| Don't know (n = 11) | | | | | | | | |
| **Q21. How much of your formal plan have you implemented? (Formal plan n= 380)** | | | | | | | | |
| All | 33 | 39 | 47 | 31 | 21 | 50 | 13 | 35 |
| Most | 52 | 44 | 32 | 38 | 45 | 29 | 43 | 38 |
| Some | 14 | 11 | 21 | 31 | 26 | 17 | 40 | 22 |
| None | | 6 | | | 7 | 5 | 3 | 5 |
| **Q25. If there were programs to help you develop an environmental plan, would you be . . .** | | | | | | | | |
| Very interested | 18 | 8 | 10 | 14 | 30 | 34 | 35 | 22 |
| Moderately interested | 28 | 33 | 31 | 32 | 32 | 38 | 24 | 32 |
| Somewhat interested | 28 | 38 | 38 | 34 | 22 | 12 | 26 | 27 |
| Not interested at all | 26 | 20 | 21 | 19 | 17 | 15 | 15 | 18 |
| Don't know (n = 32) | | | | | | | | |

## Table A4: Producer's behaviour

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q32a. Willingness to reduce GHGs** | | | | | | |
| (1) Not at all willing | 18 | 14 | 19 | 21 | 13 | 17 |
| 2 | 11 | 14 | 10 | 11 | 12 | 12 |
| 3 | 37 | 40 | 35 | 35 | 41 | 38 |
| 4 | 16 | 17 | 15 | 16 | 17 | 16 |
| (5) Very willing | 17 | 15 | 21 | 16 | 18 | 17 |
| Don't know (n = 94) | | | | | | |
| **Q32b. Willingness to reduce GHGs with government help (n = 1133)** | | | | | | |
| (1) Not at all willing | 17 | 14 | 18 | 23 | 12 | 18 |
| 2 | 17 | 12 | 12 | 10 | 16 | 13 |
| 3 | 31 | 35 | 23 | 32 | 28 | 31 |
| 4 | 25 | 24 | 26 | 20 | 29 | 24 |
| (5) Very willing | 10 | 14 | 21 | 15 | 15 | 14 |
| Don't know (n = 70) | | | | | | |
| **Q31. Should government help farmers to reduce GHGs? (n = 1309)** | | | | | | |
| Yes | 86 | 83 | 87 | 83 | 90 | 85 |
| No | 14 | 17 | 13 | 17 | 10 | 15 |
| Don't know (n = 68) | | | | | | |
| **Q31a. What type of help or support should producers received from government to help them reduce GHGs? (n = 1055) (unaided)** | | | | | | |
| Financial incentives | 49 | 54 | 54 | 45 | 53 | 50 |
| More information | 24 | 41 | 37 | 29 | 41 | 32 |
| Training | 11 | 15 | 20 | 16 | 18 | 15 |
| Emissions trading | 1 | 0 | 1 | 0 | 0 | 0.4 |
| Research | 6 | 8 | 11 | 4 | 15 | 7 |
| Regulation | 4 | 4 | 1 | 3 | 6 | 4 |
| Credit for building soil carbon | 4 | 2 | 2 | 1 | 3 | 2 |
| None of the above | 5 | 2 | 2 | 6 | 5 | 5 |
| Environmental protection | 7 | 3 | 1 | 3 | 4 | 4 |
| Cost effective measure | 1 | 1 | 0 | 0.4 | 1 | 1 |
| Don't know(n = 200) | 20 | 15 | 15 | 24 | 14 | 19 |
| **Q38. Government initiatives would be more likely to influence farmers in adopting farming practices to reduce GHGs (n = 1309)** | | | | | | |
| Technical advice and support in adopting farming practices | 27 | 31 | 34 | 29 | 34 | 30 |
| Creating an emissions trading market in Canada | 14 | 8 | 8 | 9 | 10 | 10 |
| Investing more on research on agriculture & GHGs | 27 | 29 | 30 | 26 | 33 | 28 |
| New regulations to reduce GHGs | 4 | 3 | 4 | 6 | 6 | 5 |
| Voluntary programs | 20 | 18 | 15 | 22 | 10 | 18 |
| Don't know/ refused | 8 | 10 | 9 | 9 | 8 | 8 |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 148 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q11/Q11a. Main tillage practices (n = 1383)** | | | | | | |
| Conventional tillage | 55 | 80 | 62 | 72 | 65 | 66 |
| Reduced tillage | 26 | 11 | 20 | 18 | 20 | 20 |
| No till | 20 | 9 | 18 | 10 | 14 | 14 |
| Don't know (n = 15) | | | | | | |
| **Q11. Kind of tillage (n= 1383)** | | | | | | |
| Conventional tillage | 64 | 83 | 68 | 78 | 71 | 73 |
| Reduced tillage | 41 | 21 | 35 | 22 | 31 | 30 |
| No till | 27 | 16 | 31 | 16 | 26 | 22 |
| **q12. How often do you conduct a soil test for nutrient management on a field? (n = 1409)** | | | | | | |
| Never | 17 | 10 | 11 | 28 | 8 | 18 |
| Less than once a year | 43 | 36 | 43 | 46 | 52 | 44 |
| Yearly | 39 | 53 | 46 | 26 | 40 | 38 |
| Don't know (n = 9) | | | | | | |
| **Q17. Do you have a shelter belt?** | | | | | | |
| Yes | 64 | 50 | 42 | 72 | 48 | 60 |
| No | 36 | 50 | 58 | 28 | 52 | 41 |
| Don't know (n = 5) | | | | | | |
| **Q18. Do you intend to plant a shelter belt?** | | | | | | |
| Yes | 21 | 15 | 18 | 24 | 18 | 20 |
| No | 79 | 85 | 82 | 76 | 82 | 80 |
| Don't know (n = 36) | | | | | | |
| **Q18a. Reason for planting shelter belt (n = 324)** | | | | | | |
| Windbreak | 24 | 28 | 31 | 33 | 42 | 30 |
| Erosion control | 40 | 40 | 27 | 27 | 34 | 33 |
| Snow management | 12 | 9 | 12 | 9 | 12 | 11 |
| Renovating aging windbreak/ upgrading | 17 | 19 | 8 | 24 | 12 | 18 |
| Personal comfort | 8 | 12 | 23 | 6 | 22 | 11 |
| Other | 30 | 16 | 23 | 31 | 29 | 28 |
| Don't know (n = 2) | | | | | | |
| **Q37a. If an emissions trading market were established at $3/acre (n = 1083)** | | | | | | |
| Very interested | 10 | 10 | 12 | 12 | 9 | 11 |
| Moderately interested | 27 | 34 | 18 | 30 | 30 | 29 |
| Somewhat interested | 32 | 30 | 26 | 27 | 26 | 29 |
| Not interested at all | 26 | 24 | 34 | 26 | 34 | 27 |
| Don't know | 5 | 2 | 10 | 6 | 1 | 4 |
| **Q37ai. If an emissions trading market were established at $6/acre (n = 486)** | | | | | | |
| Very interested | 8 | 8 | 11 | 9 | 7 | 8 |
| Moderately interested | 35 | 42 | 21 | 43 | 30 | 37 |
| Somewhat interested | 34 | 26 | 21 | 24 | 29 | 28 |
| Not interested at all | 20 | 23 | 37 | 17 | 28 | 21 |
| Don't know | 4 | 1 | 11 | 6 | 6 | 5 |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q37b. If an emissions trading market was established at $10/acre (n = 483)** | | | | | | |
| Very interested | 17 | 12 | 4 | 13 | 12 | 14 |
| Moderately interested | 33 | 36 | 32 | 32 | 37 | 34 |
| Somewhat interested | 20 | 29 | 20 | 22 | 22 | 23 |
| Not interested at all | 25 | 18 | 36 | 23 | 25 | 23 |
| Don't know | 5 | 5 | 8 | 10 | 3 | 6 |
| **Q35. What percent of the cost should be paid by the producer to adopt environmental farming practices to reduce GHGs?** | | | | | | |
| 0% | 35 | 21 | 18 | 34 | 24 | 29 |
| 1–4% | 5 | 6 | 2 | 4 | 3 | 4 |
| 5–10% | 13 | 9 | 15 | 12 | 14 | 12 |
| 11–25% | 12 | 17 | 16 | 14 | 15 | 14 |
| 26–50% | 28 | 37 | 35 | 30 | 38 | 32 |
| 51–75% | 3 | 4 | 5 | 2 | 3 | 3 |
| More than 75% | 5 | 5 | 7 | 5 | 3 | 5 |
| Don't know (n = 138) | | | | | | |
| **Q8b. Do you have a liquid or solid manure system? (n = 1369)** | | | | | | |
| Solid manure system | 74 | 54 | 64 | 82 | 12 | 61 |
| Liquid manure system | 5 | 22 | 10 | 0 | 63 | 18 |
| Both | 4 | 21 | 13 | 3 | 24 | 11 |
| No system | 18 | 2 | 13 | 15 | 1 | 10 |
| Don't know (n = 3) | | | | | | |
| **Q9a. What type of manure storage system do you use? (n = 1225)** | | | | | | |
| Earthen lagoon | 7 | 22 | 16 | 3 | 20 | 12 |
| Concrete lagoon | 4 | 25 | 11 | 3 | 41 | 16 |
| Bare ground | 69 | 25 | 29 | 68 | 10 | 43 |
| Tanks | 1 | 10 | 12 | 2 | 28 | 10 |
| Gravel/ cement pad | 12 | 22 | 17 | 13 | 13 | 15 |
| Other | 11 | 7 | 27 | 17 | 3 | 12 |
| Don't know (n = 1) | | | | | | |
| **Q13a. Do you apply manure on land you farm?** | | | | | | |
| Yes | 52 | 99 | 69 | 89 | 91 | 78 |
| No | 48 | 1 | 31 | 11 | 9 | 22 |
| Don't know (n = 4) | | | | | | |
| **Q13c. Did you also do a spring application? (n = 807)** | | | | | | |
| Yes | 24 | 69 | 73 | 31 | 72 | 51 |
| No | 76 | 31 | 27 | 69 | 28 | 49 |
| Don't know (n= 2) | | | | | | |
| **Q15_a. Would you say you rotate the field on which you apply manure . . . (n = 1280)** | | | | | | |
| All the time | 67 | 71 | 67 | 64 | 68 | 67 |
| Most of the time | 17 | 18 | 9 | 18 | 13 | 16 |
| Some of the time | 11 | 7 | 9 | 13 | 12 | 11 |
| Never | 5 | 4 | 15 | 4 | 6 | 6 |
| Don't know (n = 8) | | | | | | |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q15_b. Would you say you spread manure on frozen ground . . . (n = 1280)** | | | | | | |
| All the time | 1 | 3 | 3 | 2 | 6 | 3 |
| Most of the time | 2 | 1 | 2 | 1 | 0 | 2 |
| Some of the time | 16 | 20 | 19 | 21 | 16 | 19 |
| Never | 80 | 76 | 76 | 76 | 77 | 76 |
| Don't know (n = 3) | | | | | | |
| **Q15_c. Would you say you conduct soil test and apply manure accordingly . . . (n= 1280)** | | | | | | |
| All the time | 13 | 32 | 27 | 9 | 39 | 21 |
| Most of the time | 9 | 21 | 20 | 9 | 12 | 13 |
| Some of the time | 19 | 18 | 21 | 18 | 22 | 19 |
| Never | 59 | 29 | 32 | 64 | 27 | 47 |
| Don't know (n = 8) | | | | | | |
| **Q15_d. Would you say you inject liquid manure into the ground . . . (n = 1280)** | | | | | | |
| All the time | 2 | 2 | 2 | 1 | 11 | 3 |
| Most of the time | 1 | 3 | 3 | 0 | 7 | 2 |
| Some of the time | 4 | 4 | 1 | 1 | 9 | 4 |
| Never | 93 | 91 | 94 | 97 | 73 | 91 |
| Don't know (n = 3) | | | | | | |
| **Q15b_a. Would you say you spread solid/liquid manure on top of the ground . . . (n = 1280)** | | | | | | |
| All the time | 72 | 70 | 62 | 75 | 75 | 72 |
| Most of the time | 8 | 12 | 9 | 9 | 7 | 9 |
| Some of the time | 10 | 12 | 8 | 9 | 11 | 10 |
| Never | 10 | 6 | 20 | 7 | 7 | 9 |
| Don't know (n = 4) | | | | | | |
| **Q15b_b. Would you say you incorporate the manure immediately after application . . . (n= 1168)** | | | | | | |
| All the time | 39 | 35 | 28 | 33 | 39 | 35 |
| Most of the time | 25 | 26 | 20 | 17 | 29 | 23 |
| Some of the time | 20 | 30 | 27 | 28 | 18 | 25 |
| Never | 16 | 10 | 24 | 22 | 13 | 17 |
| Don't know (n = 25) | | | | | | |
| **Q15b_c. Would you say you incorporate the manure later in the season . . . (n = 1168)** | | | | | | |
| All the time | 18 | 12 | 12 | 15 | 14 | 14 |
| Most of the time | 13 | 13 | 14 | 11 | 12 | 12 |
| Some of the time | 26 | 34 | 24 | 32 | 27 | 30 |
| Never | 42 | 41 | 50 | 42 | 47 | 43 |
| Don't know (n = 30) | | | | | | |
| **Q16. Would you say you use the same practices on rented land? (n = 654)** | | | | | | |
| Yes | 75 | 78 | 82 | 58 | 82 | 72 |
| No | 25 | 22 | 18 | 42 | 18 | 28 |
| Don't know (n = 7) | | | | | | |
| **Q19. Do you have an environmental plan?** | | | | | | |
| Yes | 27 | 48 | 52 | 27 | 48 | 36 |
| No | 53 | 45 | 40 | 57 | 41 | 50 |
| No, but have environmental practices | 20 | 8 | 8 | 16 | 11 | 14 |
| Don't know (n = 25) | | | | | | |

| Farm type | Field crops | Dairy | Poultry | Beef | Hogs | Total |
|---|---|---|---|---|---|---|
| n= | 495 | 289 | 146 | 477 | 236 | 1643 |
| | | | % | | | |
| **Q22. Is it a formal plan developed in conjunction with a formal environmental program? (n = 1643)** | | | | | | |
| Yes | 13 | 38 | 37 | 12 | 39 | 23 |
| No | 87 | 62 | 63 | 88 | 61 | 77 |
| **Q23. Are you considering a formal plan? (n = 1263)** | | | | | | |
| Yes | 10 | 36 | 23 | 14 | 40 | 19 |
| Maybe | 11 | 12 | 3 | 11 | 14 | 11 |
| No | 79 | 52 | 73 | 75 | 45 | 70 |
| Don't know (n = 39) | | | | | | |
| **Q20. How many years have you had your plan? (Formal plan n =380 )** | | | | | | |
| 1–5 years | 71 | 91 | 81 | 81 | 92 | 85 |
| 6 years and over | 29 | 9 | 19 | 19 | 8 | 15 |
| Don't know (n = 11) | | | | | | |
| **Q21. How much of your formal plan have you implemented? (Formal plan n= 380)** | | | | | | |
| All | 36 | 34 | 39 | 21 | 43 | 35 |
| Most | 35 | 39 | 37 | 45 | 34 | 38 |
| Some | 26 | 23 | 19 | 31 | 15 | 22 |
| None | 3 | 4 | 6 | 3 | 8 | 5 |
| **Q25. If there were programs to help you develop an environmental plan, would you be . . .** | | | | | | |
| Very interested | 14 | 35 | 27 | 18 | 28 | 22 |
| Moderately interested | 32 | 32 | 32 | 30 | 39 | 32 |
| Somewhat interested | 34 | 21 | 22 | 30 | 18 | 27 |
| Not interested at all | 20 | 12 | 18 | 22 | 15 | 18 |
| Don't know (n = 29) | | | | | | |

## Table A4: Producer's behaviour

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q32a. Willingness to reduce GHGs** | | | | | | |
| (1) Not at all willing | 19 | 18 | 15 | 13 | 17 | 16 |
| 2 | 13 | 8 | 12 | 11 | 16 | 12 |
| 3 | 32 | 39 | 40 | 43 | 37 | 38 |
| 4 | 15 | 16 | 20 | 17 | 14 | 17 |
| (5) Very willing | 20 | 19 | 13 | 17 | 17 | 17 |
| Don't know (n = 94) | | | | | | |
| **Q32b. Willingness to reduce GHGs with government help (n = 1133)** | | | | | | |
| (1) Not at all willing | 21 | 19 | 16 | 10 | 13 | 17 |
| 2 | 15 | 9 | 14 | 13 | 11 | 13 |
| 3 | 38 | 28 | 29 | 34 | 30 | 32 |
| 4 | 15 | 29 | 28 | 30 | 26 | 25 |
| (5) Very willing | 11 | 15 | 14 | 14 | 20 | 14 |
| Don't know (n = 70) | | | | | | |
| **Q31. Should government help the farmers to reduce GHGs? (n = 1309)** | | | | | | |
| Yes | 87 | 82 | 87 | 84 | 88 | 86 |
| No | 13 | 18 | 13 | 16 | 12 | 14 |
| Don't know (n = 68) | | | | | | |
| **Q31a. What type of help or support should producers receive from government to help them to reduce GHGs? (n = 1055) ( unaided)** | | | | | | |
| Financial incentives | 47 | 45 | 49 | 57 | 57 | 50 |
| More information | 25 | 29 | 35 | 37 | 38 | 32 |
| Training | 18 | 18 | 14 | 15 | 9 | 15 |
| Emissions trading | 0 | 1 | 0.3 | 0 | 0 | 0.2 |
| Research | 4 | 6 | 9 | 8 | 13 | 8 |
| Regulation | 3 | 1 | 4 | 7 | 6 | 4 |
| Credit for building soil carbon | 1 | 3 | 2 | 2 | 3 | 2 |
| None of the above | 4 | 9 | 3 | 5 | 2 | 5 |
| Environmental protection | 4 | 4 | 4 | 2 | 5 | 4 |
| Cost effective measure | 0.4 | 0 | 1 | 0 | 0 | 1 |
| Don't know (n = 200) | 28 | 24 | 17 | 11 | 12 | 19 |
| **Q38. Government initiatives would be more likely to influence farmers in adopting farming practices to reduce GHGs (n = 1309)** | | | | | | |
| Technical advice and support in adopting farming practices | 29 | 28 | 34 | 28 | 27 | 30 |
| Creating an emissions trading market in Canada | 7 | 12 | 13 | 9 | 12 | 11 |
| Investing more on research on agriculture & GHGs | 29 | 27 | 26 | 32 | 32 | 29 |
| New regulations to reduce GHGs | 5 | 7 | 4 | 5 | 5 | 5 |
| Voluntary programs | 22 | 19 | 15 | 18 | 16 | 18 |
| Don't know/refused | 8 | 7 | 7 | 9 | 9 | 8 |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q11/Q11a. Main tillage practices (n = 1383)** | | | | | | |
| Conventional tillage | 82 | 66 | 63 | 63 | 54 | 67 |
| Reduced tillage | 8 | 23 | 23 | 21 | 27 | 20 |
| No till | 10 | 11 | 14 | 16 | 20 | 13 |
| Don't know (n = 15) | | | | | | |
| **Q11. Kind of tillage (n = 1383)** | | | | | | |
| Conventional tillage | 85 | 71 | 70 | 70 | 59 | 73 |
| Reduced tillage | 15 | 35 | 34 | 36 | 41 | 31 |
| No till | 13 | 18 | 23 | 26 | 30 | 21 |
| **Q12. How often do you conduct soil test for nutrient management on a field? (n = 1409)** | | | | | | |
| Never | 33 | 21 | 13 | 5 | 6 | 18 |
| Less than once a year | 41 | 46 | 43 | 44 | 47 | 44 |
| Yearly | 26 | 33 | 43 | 51 | 47 | 39 |
| Don't know (n = 9) | | | | | | |
| **Q17. Do you have a shelter belt?** | | | | | | |
| Yes | 61 | 65 | 59 | 55 | 52 | 59 |
| No | 39 | 35 | 41 | 45 | 48 | 41 |
| Don't know (n = 5) | | | | | | |
| **Q18. Do you intend to plant a shelter belt?** | | | | | | |
| Yes | 20 | 25 | 19 | 18 | 17 | 20 |
| No | 80 | 75 | 81 | 82 | 83 | 80 |
| Don't know (n = 36) | | | | | | |
| **Q18a. Reason for planting a shelter belt (n= 324)** | | | | | | |
| Windbreak | 37 | 26 | 29 | 26 | 36 | 31 |
| Erosion control | 29 | 42 | 33 | 37 | 23 | 33 |
| Snow management | 11 | 12 | 11 | 6 | 16 | 11 |
| Renovating aging windbreak/ upgrading | 16 | 21 | 19 | 17 | 10 | 18 |
| Personal comfort | 8 | 9 | 9 | 14 | 26 | 11 |
| Other | 25 | 33 | 28 | 31 | 19 | 28 |
| Don't know (n = 2) | | | | | | |
| **Q37a. If an emissions trading market were established at $3/acre (n = 1083)** | | | | | | |
| Very interested | 9 | 10 | 13 | 9 | 14 | 11 |
| Moderately interested | 27 | 36 | 31 | 32 | 20 | 29 |
| Somewhat interested | 30 | 30 | 28 | 28 | 29 | 29 |
| Not interested at all | 30 | 19 | 25 | 28 | 33 | 27 |
| Don't know | 4 | 6 | 3 | 3 | 4 | 4 |
| **Q37ai. If an emissions trading market were established at $6/acre (n = 486)** | | | | | | |
| Very interested | 9 | 8 | 12 | 7 | 2 | 8 |
| Moderately interested | 35 | 43 | 38 | 36 | 32 | 37 |
| Somewhat interested | 34 | 25 | 27 | 29 | 25 | 28 |
| Not interested at all | 19 | 19 | 18 | 24 | 34 | 21 |
| Don't know | 2 | 4 | 6 | 4 | 7 | 5 |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q37b. If an emissions trading market were established at $10/acre (n = 483)** | | | | | | |
| Very interested | 11 | 27 | 15 | 10 | 7 | 14 |
| Moderately interested | 32 | 27 | 38 | 36 | 31 | 34 |
| Somewhat interested | 21 | 23 | 24 | 19 | 36 | 23 |
| Not interested at all | 30 | 14 | 18 | 26 | 19 | 23 |
| Don't know | 6 | 8 | 5 | 9 | 7 | 6 |
| **Q35. What percent of the cost should be paid by the producer to adopt environmental farming practices to reduce GHGs?** | | | | | | |
| 0% | 34 | 21 | 27 | 25 | 29 | 28 |
| 1–4% | 6 | 8 | 3 | 3 | 5 | 5 |
| 5–10% | 11 | 12 | 13 | 12 | 14 | 12 |
| 11–25% | 11 | 14 | 14 | 16 | 18 | 14 |
| 26–50% | 31 | 35 | 35 | 36 | 28 | 33 |
| 51–75% | 4 | 3 | 2 | 3 | 3 | 3 |
| More than 75% | 4 | 7 | 6 | 4 | 4 | 5 |
| Don't know (n = 138) | | | | | | |
| **Q8b. Do you have a liquid or solid manure system? (n= 1369)** | | | | | | |
| Solid manure system | 81 | 73 | 61 | 35 | 34 | 60 |
| Liquid manure system | 6 | 10 | 17 | 35 | 35 | 18 |
| Both | 3 | 3 | 12 | 23 | 23 | 12 |
| No system | 10 | 13 | 10 | 7 | 8 | 10 |
| Don't know (n = 3) | | | | | | |
| **Q9a. What type of manure storage system do you use? (n = 1225)** | | | | | | |
| Earthen lagoon | 5 | 6 | 12 | 24 | 24 | 13 |
| Concrete lagoon | 9 | 8 | 16 | 31 | 27 | 17 |
| Bare ground | 63 | 55 | 42 | 20 | 20 | 43 |
| Tanks | 1 | 6 | 10 | 18 | 19 | 10 |
| Gravel/cement pad | 16 | 16 | 15 | 12 | 14 | 15 |
| Other | 12 | 17 | 13 | 7 | 12 | 12 |
| Don't know (n = 1) | | | | | | |
| **Q13a. Do you apply manure on land you farm?** | | | | | | |
| Yes | 72 | 74 | 84 | 87 | 77 | 79 |
| No | 28 | 26 | 16 | 13 | 23 | 21 |
| Don't know (n = 4) | | | | | | |
| **Q13c. Did you also do a spring application? (n = 807)** | | | | | | |
| Yes | 36 | 40 | 51 | 66 | 66 | 51 |
| No | 64 | 60 | 49 | 34 | 34 | 49 |
| Don't know (n = 2) | | | | | | |
| **Q15_a. Would you say you rotate the field on which you apply manure . . . (n = 1280)** | | | | | | |
| All the time | 64 | 64 | 70 | 69 | 70 | 67 |
| Most of the time | 20 | 14 | 17 | 15 | 12 | 16 |
| Some of the time | 11 | 17 | 9 | 10 | 8 | 11 |
| Never | 6 | 4 | 3 | 6 | 10 | 5 |
| Don't know (n = 8) | | | | | | |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q15_b. Would you say you spread manure on frozen ground . . . (n = 1280)** | | | | | | |
| All the time | 2 | 3 | 3 | 3 | 2 | 3 |
| Most of the time | 1 | 1 | 2 | 1 | 1 | 2 |
| Some of the time | 17 | 20 | 22 | 16 | 15 | 19 |
| Never | 79 | 75 | 73 | 79 | 81 | 77 |
| Don't know (n = 3) | | | | | | |
| **Q15_c. Would you say you conduct a soil test and apply manure accordingly . . . (n = 1280)** | | | | | | |
| All the time | 12 | 11 | 22 | 34 | 41 | 22 |
| Most of the time | 8 | 10 | 14 | 17 | 19 | 13 |
| Some of the time | 18 | 21 | 19 | 19 | 18 | 19 |
| Never | 62 | 58 | 46 | 31 | 22 | 47 |
| Don't know (n = 8) | | | | | | |
| **Q15_d. Would you say you inject liquid manure into the ground . . . (n = 1280)** | | | | | | |
| All the time | 2 | 2 | 2 | 6 | 11 | 4 |
| Most of the time | 1 | 0 | 3 | 3 | 6 | 2 |
| Some of the time | 1 | 4 | 3 | 7 | 6 | 4 |
| Never | 95 | 94 | 93 | 84 | 76 | 90 |
| Don't know (n = 3) | | | | | | |
| **Q15b_a. Would you say you spread solid/liquid manure on top of the ground . . . (n = 1280)** | | | | | | |
| All the time | 75 | 76 | 72 | 69 | 64 | 72 |
| Most of the time | 10 | 7 | 9 | 14 | 9 | 9 |
| Some of the time | 9 | 7 | 12 | 12 | 13 | 11 |
| Never | 7 | 10 | 8 | 5 | 14 | 8 |
| Don't know (n = 4) | | | | | | |
| **Q15b_b. Would you say you incorporate the manure immediately after application . . . (n= 1168)** | | | | | | |
| All the time | 31 | 34 | 37 | 36 | 45 | 36 |
| Most of the time | 17 | 21 | 26 | 24 | 24 | 23 |
| Some of the time | 25 | 28 | 25 | 27 | 21 | 25 |
| Never | 27 | 17 | 12 | 13 | 11 | 17 |
| Don't know (n = 25) | | | | | | |
| **Q15b_c. Would you say you incorporate it later in the season . . . (n = 1168)** | | | | | | |
| All the time | 13 | 13 | 15 | 15 | 10 | 14 |
| Most of the time | 14 | 13 | 13 | 11 | 9 | 13 |
| Some of the time | 27 | 32 | 33 | 28 | 24 | 30 |
| Never | 45 | 42 | 40 | 46 | 56 | 44 |
| Don't know (n = 30) | | | | | | |
| **Q16. Would you say you use the same practices on rented land? (n = 654)** | | | | | | |
| Yes | 65 | 65 | 70 | 76 | 89 | 72 |
| No | 35 | 35 | 30 | 24 | 11 | 28 |
| Don't know (n = 7) | | | | | | |

| Farm sales | Less than $50,000 | $50,000 to $99,999 | $100,000 to $249,999 | $250,000 to $499,999 | $500,000 and over | Total |
|---|---|---|---|---|---|---|
| n= | 395 | 273 | 478 | 196 | 189 | 1531 |
| | | | % | | | |
| **Q19. Do you have an environmental plan?** | | | | | | |
| Yes | 27 | 27 | 36 | 48 | 54 | 36 |
| No | 59 | 57 | 49 | 38 | 33 | 50 |
| No, but have environmental practices | 14 | 16 | 15 | 14 | 13 | 15 |
| Don't know (n = 25) | | | | | | |
| **Q22. Is it a formal plan developed in conjunction with a formal environmental program? (n= 1643)** | | | | | | |
| Yes | 15 | 15 | 24 | 37 | 39 | 23 |
| No | 85 | 85 | 76 | 63 | 61 | 77 |
| **Q23. Are you considering a formal plan? (n = 1263)** | | | | | | |
| Yes | 12 | 17 | 21 | 29 | 33 | 20 |
| Maybe | 7 | 14 | 12 | 18 | 7 | 11 |
| No | 81 | 69 | 67 | 54 | 60 | 69 |
| Don't know (n = 39) | | | | | | |
| **Q20. How many years have you had your plan? (Formal plan n =380 )** | | | | | | |
| 1 to 5 | 83 | 76 | 84 | 89 | 89 | 85 |
| 6 and over | 17 | 24 | 16 | 11 | 11 | 15 |
| Don'T know (n =11) | | | | | | |
| **Q21. How much of your formal plan have you implemented? (Formal plan n= 380)** | | | | | | |
| All | 34 | 40 | 27 | 41 | 42 | 35 |
| Most | 29 | 24 | 44 | 40 | 42 | 38 |
| Some | 26 | 31 | 25 | 16 | 12 | 22 |
| None | 10 | 5 | 4 | 3 | 4 | 5 |
| **Q25. If there were programs to help you develop an environmental plan, would you be . . .** | | | | | | |
| Very interested | 14 | 22 | 22 | 29 | 33 | 22 |
| Moderately interested | 30 | 35 | 36 | 33 | 27 | 33 |
| Somewhat interested | 31 | 24 | 31 | 26 | 19 | 28 |
| Not interested at all | 24 | 19 | 12 | 12 | 21 | 17 |
| Don't know (n = 29) | | | | | | |

# Appendix B: Questionnaire

Hello, my name is _____ and I'm calling from Criterion Research/Léger Marketing . We are a professional market research company based in Winnipeg/Montreal. We are conducting an important survey on behalf of Agriculture and Agri-Food Canada, asking about issues facing Canadian farmers.

**(READ ONLY IF GETTING SOME RESISTANCE FROM RESPONDENT:)**
"We have tested the survey for length and farmers have appreciated being able to give their feedback. In fact, many producers feel it is very important that their views be heard. Let me assure you that we are not selling anything and your identity will be kept confidential."

**(READ ONLY IF RESPONDENT RECENTLY SURVEYED BY LÉGER MARKETING:)**
"I realize that you may have recently completed a survey with Léger Marketing, but given the national importance of this research, we wanted to make sure all farmers have the opportunity to have their opinions heard."

### Section 1: Introduction

S1. Are you the main/joint decision maker for your farm operation and over 18 years of age?

| | |
|---|---|
| Yes | .....1 - **SKIP TO S2** |
| Joint | .....2 - **SKIP TO S2** |
| No | .....3 - **CONTINUE** |

Interviewer note: A farm OPERATOR is an individual responsible for the day-to-day operation of the farm who participates in the decisions to borrow money; to rent, buy or sell assets; and to reduce debts. An operation may have more than one operator but only one questionnaire is to be completed for each operation. The person responsible for day-to-day operations.

S1a. May I speak to the person who makes these decisions?

Yes .....1 - CONTINUE
No, not available now .....2 - SCHEDULE CALL BACK
No, not interested .....3 - THANK & TERMINATE

As this is a national survey of Canadian farmers we need representation from different farm types. I would like to ask you a few questions about your farm before we start.

S2. In 2000, did your farm receive $10,000 or more in "gross" farm revenue, including government payments but before any deductions?

Yes .....1 - CONTINUE
No .....2 - THANK & TERMINATE

## Section 2: Farm Operation

1a. And what types of production do you have on your operation? **(Read list. Record all mentions. Info in brackets for interviewer use. Read for clarification only)**

**Field Crops** (e.g., cereals, oilseeds, pulse crops, tame hay, row crops, tobacco, potatoes, sugar beets, other field crops) ..... 1
**Milk** ..... 2
**Poultry** (e.g., hens, chickens, turkeys, chicks, game birds, eggs, other) ..... 3
**Cattle** (e.g., cow/calf, backgrounding, feedlot) ..... 4
**Pigs** (e.g., farrow-to-finish, weanlings, finishing) ..... 5
**Other Livestock** (e.g., sheep, bison, horses, Llamas, ostrich etc.) ..... 6
**Horticulture** (e.g., fruits, nuts ,vegetables, greenhouse, nursery, etc) ..... 7
**Other (PLEASE SPECIFY)** _____ ..... __
(e.g., christmas trees, woodlots, mushrooms, sod, honey, maple syrup, etc.)

1b. And what normally contributes most to your farm receipts each year? **IF UNSURE ASK:** Which is likely to contribute most to your farm receipts this year? **RECORD**

_____

***ALLOW 25 HORTICULTURE SURVEYS BEFORE CUTOFF. AFTER 25, IF HORTICULTURE OR OTHER PRODUCTION AS MAIN PRODUCTION, THANK AND TERMINATE.***

***INTERVIEWER NOTE: WE NEED TO DETERMINE "MAIN FARM TYPE" AND WE ARE NOT LOOKING FOR PRECISE NUMBERS. THE RESPONDENT'S OWN ESTIMATE IS BETTER THAN ANY OTHER.***

1c. **IF CATTLE IN Q1a or Q1b, ASK:** What type of cattle operation do you have? **DO NOT READ LIST. RECORD ONE ANSWER ONLY**

Cow/calf .....1
Backgrounding.....2
Semi-finish .....3
Feedlot .....4
Custom grazing.....5

***General Behaviour***

2. In the last year, have you read, seen, or heard any information on issues of importance to agriculture and your operation?

| | |
|---|---|
| Yes | 1 - **CONTINUE** |
| No | 2 - **SKIP TO Q. 4a** |
| Not stated | 9 - **SKIP TO Q. 4a** |

3. How did you receive this information? **DO NOT READ LIST**

| | First Mention | Other Mentions |
|---|---|---|
| Scientific journals, Research Centers | 1 | 1 |
| Other farmers/word of mouth | 2 | 2 |
| Agricultural journals | 3 | 3 |
| Trade and farm shows | 4 | 4 |
| Internet | 5 | 5 |
| Newspapers | 6 | 6 |
| TV | 7 | 7 |
| Radio | 8 | 8 |
| Postal services | 9 | 9 |
| Conferences | 10 | 10 |
| Other (SPECIFY) _____ | | |
| Don't know | 99 | |

3a. And who was responsible for this information? Was it .... **READ LIST - CIRCLE ALL THAT APPLY**

| | |
|---|---|
| Extension services | 2 |
| Financial Institution | 3 |
| Producer associations | 4 |
| Government | 5 |
| Industry | 6 |
| None of them | 1 |
| Don't know | 99 |

(IF "INTERNET" MENTIONED IN Q.3 SKIP TO Q.4b.)

4a. Are you connected to the Internet?

| | |
|---|---|
| Yes | 1 - **CONTINUE** |
| No | 2 - **SKIP TO Q. 5** |
| Not stated | 9 - **SKIP TO Q. 5** |

4b. How frequently do you use the Internet? Would it be daily, weekly, monthly, or less than once a month?

| | |
|---|---|
| Daily | 1 |
| Weekly | 2 |
| Monthly | 3 |
| Less than once/month | 4 |
| Don't know | 9 |

5. In the last two years, how often have you....? **READ LIST ONE AT A TIME.** Is that.. ...? **READ RATING** What about...?

| | Not in the past 2 years | Only once in the past 2 years | Once a year annually | Several times per year |
|---|---|---|---|---|
| Attended seminars and taken training courses or home study courses | 1 | 2 | 3 | 4 |
| Made use of resource people like extension specialists | 1 | 2 | 3 | 4 |
| Locked in prices for commodities you produce | 1 | 2 | 3 | 4 |
| Hired custom services like spraying, custom harvesting, custom feeding, etc. | 1 | 2 | 3 | 4 |

5b. Using a 5-point scale where 1 means you "Strongly Agree" and 5 means you "strongly disagree." Please choose a number that represents how much you agree or disagree with the following statements:

Strongly agree (1).....(2).....(3).....(4).....Strongly disagree (5)

Managing risk associated with uncertainty is my responsibility.
Reinvesting in my farm makes more sense than making non farm investments.
I plan to make important changes in the way I market the commodities I produce.
I am always the first one in my area to try new technology and new products.

***Farming Practices***
*Livestock*

**IF DAIRY, POULTRY, CATTLE, PIGS, OR OTHER LIVESTOCK NOT MENTIONED IN Q1a, SKIP TO Q.10a**

8. How many animals in each of the following categories do you keep on your farm? **PROBE IF NUMBER VARIES BY SEASON** On average, what number do you maintain throughout the year?

Dairy ..... 1
Poultry (e.g., hens, chickens, turkeys, chicks, game birds, eggs, other) ..... 2
Cattle (e.g., cow/calf, backgrounding, feedlot) ..... 3
Pigs (e.g., farrow-to-finish, weanlings, finishing) ..... 4
Other Livestock (e.g., sheep, bison, horses, Llamas, ostrich etc.) ..... 5

8b. Do you have a liquid or solid manure system?

Solid manure system ..... 1
Liquid manure system ..... 2
Both ..... 3
No system ..... 4 - **SKIP TO Q.10a**
Don't know ..... 9 - **SKIP TO Q.10a**

9a. What type of manure storage systems do you use? **DO NOT READ LIST. COLLECT AS MANY AS STATED (PROBE: IF RESPONDENT SAYS IT IS IN A PILE, ASK WHAT IT IS SITTING ON)**

Earthen lagoon ..... 01
Concrete lagoon ..... 02
Steel-glass ..... 03
Bare ground ..... 04
Pad with berms ..... 05
Pad without berms ..... 06
Other (**SPECIFY**)

_____

Don't know ..... 99

### *Farming Practices*

*Crops*

10a. Of the total acres you have on your farm, how much of that would be in each of these categories. The categories are ... How much of your total acres would be? Please include all pasture, wooded areas and land you rent from others. Don't include any land you rent out to other farmers.

| | | |
|---|---|---|
| Seeded Crop land | __ __ , __ __ __ acres | IF "O" SKIP TO Q13a |
| Forages, Grass or hay land | __ __ , __ __ __ acres | |
| Grazing and pasture land | __ __ , __ __ __ acres | |
| Wooded Areas | __ __ , __ __ __ acres | |
| Summerfallow | __ __ , __ __ __ acres | |
| Other (specify) | __ __ , __ __ __ acres | |
| **DO NOT READ -TOTAL** | __ __ , __ __ __ acres | |

10b. Of the ____ **(insert answer from Q.10a)** of seeded crop land, what type of crops did you plant this year? What percentage of all your seeded land would be ..... **(Do percentage for up to 3 crop types, record all crop types). DO NOT READ LIST. IF "NONE" SKIP TO Q.12**

| | | |
|---|---|---|
| Wheat | 01 | _____ |
| Canola | 02 | _____ |
| Barley | 03 | _____ |
| Corn | 04 | _____ |
| Soybeans | 05 | _____ |
| Potatoes | 06 | _____ |
| Lentils | 07 | _____ |
| Field Peas | 08 | _____ |
| Flax | 09 | _____ |
| Oats | 10 | _____ |
| Other **(SPECIFY)** | | |

_____ _____

10d. How much land do you rent from another farmer, if any? _____

11. What kind of tillage practice(s) was/were used on your seeded acres this year? Was it ..... ? **READ LIST. CIRCLE ALL THAT APPLY.**

| | |
|---|---|
| Conventional tillage | 1 |
| Reduced tillage | 2 |
| No-till | 3 |

11a. **IF MORE THAN ONE, ASK**: Which is mostly used?

| | |
|---|---|
| Conventional tillage | 1 |
| Reduced tillage | 2 |
| No-till | 3 |

12. How often do you conduct soil tests for nutrient management on a field? **READ LIST**

| | | |
|---|---|---|
| | Never | 1 |
| | Less than once a year | 2 |
| | Yearly | 3 |
| **DO NOT READ** | Don't know/not stated | 9 |

**ASK ALL**

13a. Do you apply manure on land you farm?

| | |
|---|---|
| Yes | 1 - **CONTINUE** |
| No | 2 - **SKIP TO Q.17** |

13b. In what month did you last apply manure on your farm in the year 2000 (MONTH) **PROBE FOR SPRING APPLICATION IF FALL MONTH GIVEN**

_____ , _____

14. What was the total acreage of your farm that was fertilized with manure this past year?

_____

15. Which of the following manure management practices do you use? Would you say you ..... All the time, most of the time, some of the time, never?

**ROTATE FIRST FOUR STATEMENTS**

| | **All the time** | **Most of the time** | **Some of the time** | **Never** |
|---|---|---|---|---|
| Rotate the fields on which you apply manure | .....1..... | .....2..... | .....3..... | .....4..... |
| Spread manure on frozen ground | .....1..... | .....2..... | .....3..... | .....4..... |
| Conduct soil tests and apply manure accordingly | .....1..... | .....2..... | .....3..... | .....4..... |
| Inject liquid manure on the top of the ground | .....1..... | .....2..... | .....3..... | .....4..... |

15b. Spread solid/liquid manure on the top of the ground : **if 1, 2 or 3 ask i and ii , if never skip to 16a**

| | | | | |
|---|---|---|---|---|
| i) Incorporate immediately after application | .....1..... | .....2..... | .....3..... | .....4..... |
| ii) incorporate later in the season | .....1..... | .....2..... | .....3..... | .....4..... |

16. Do you use the same practices on the rented land as you do on your own land?

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't know | 9 |

17. Do you have shelter belts, field belts, or wind breaks on your farm?

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't know | 9 |

18. Are you likely to plant new shelter belts, field belts or wind breaks within the next three years?

| | | |
|---|---|---|
| Yes | 1 | **CONTINUE** |
| No | 2 | **SKIP TO Q. 19** |
| Don't know | 9 | **SKIP TO Q. 19** |

18a. Why do you intend to plant new shelter belts, field belts or wind breaks? **DO NOT READ LIST. RECORD FIRST MENTION AND OTHER MENTIONS**

| | First mention | Other mentions |
|---|---|---|
| Energy Savings | 01 | 01 |
| Windbreak | 02 | 02 |
| Erosion control | 03 | 03 |
| Wildlife habitat | 04 | 04 |
| Carbon sequestration | 05 | 05 |
| Snow management | 06 | 06 |
| Other (SPECIFY)..... | __ | __ |
| Don't know | 99 | |

***ENVIRONMENTAL PLAN***

19. Do you have an environmental farm management plan on your farm? **DO NOT READ LIST**

| | |
|---|---|
| Yes | 1 - **CONTINUE** |
| No | 2 - **SKIP TO Q.23** |
| No, but have environmental practices | 3 - **SKIP TO Q.23** |
| Don't know | 9 - **SKIP TO Q.23** |

20. How many years have you had your plan? _____

21. How much of your plan have you implemented? **READ LIST**

| | | |
|---|---|---|
| | All | 1 |
| | Most | 2 |
| | Some | 3 |
| | None | 4 |
| **DO NOT READ** | Don't know/not stated | 9 |

22. Is that a formal plan developed in conjunction with a formal environmental program?

| | |
|---|---|
| Yes | 1 - **SKIP TO Q.24** |
| No | 2 - **CONTINUE** |
| Don't know | 9 - **CONTINUE** |

23. Are you considering a formal environmental plan for your farm?

| | |
|---|---|
| Yes | 1 - **CONTINUE** |
| Maybe | 2 - **CONTINUE** |
| No | 3 - **SKIP TO Q.25** |
| Don't know | 9 - **SKIP TO Q.25** |

24. Of the following five sources, which one would you expect to be the best for information on Environmental Plans? **READ LIST. ACCEPT ONE ANSWER**

| | | |
|---|---|---|
| | Extension services | 1 |
| | Financial institutions | 2 |
| | Producer associations | 3 |
| | Government | 4 |
| | Industry | 5 |
| **DO NOT READ** | Don't know | 9 |

25. If there were programs to help you develop an environmental plan for your farm, would you be ... ? **READ LIST**

| | | |
|---|---|---|
| | Very interested | 1 |
| | Moderately interested | 2 |
| | Somewhat interested | 3 |
| | Not interested at all | 4 |
| **DO NOT READ** | Don't know | 9 |

***Producers Perception of Climate change***

26. When it comes to the environment, what do you think is the most significant impact of agriculture on the environment in Canada? Would it be ...**ROTATE AND READ LIST.**

| | | |
|---|---|---|
| | Climate change | 1 |
| | Soil erosion | 2 |
| | Water pollution | 3 |
| | Loss of wildlife habitat | 4 |
| | Odour | 5 |
| | Other(specify) | 6 |
| | Or Don't know | 9 |
| **DO NOT READ** | None | 7 |

27. What level of impact does agriculture production have on :

27a. Climate Change:

| | | |
|---|---|---|
| | Very important | 1 |
| | Moderately important | 2 |
| | Somewhat important | 3 |
| | Not at all important | 4 |
| **DO NOT READ** | Don't know | 9 |

Or What level of impact does agriculture production have on :

27b. Green house gas emissions:

| | | |
|---|---|---|
| _____ | Very important | 1 |
| | Moderately important | 2 |
| | Somewhat important | 3 |
| | Not at all important | 4 |
| **DO NOT READ** | Don't know | 9 |

28. For each of the following statements, please indicate if you agree or disagree, or don't know. The first statement is ..... **READ**

| | Agree | Disagree | Don't Know |
|---|---|---|---|
| Climate change is caused by human activities | 1 | 2 | 9 |
| The Kyoto Protocol brought together countries to reduce greenhouse gas emissions | 1 | 2 | 9 |
| Agriculture contributes 10% of Canada's total greenhouse gas emissions | 1 | 2 | 9 |
| Carbon dioxide is agriculture's major greenhouse gas | 1 | 2 | 9 |

Only ask those who think there is a impact or don't know in 27a, otherwise skip to Q.30

29. I am now going to read out a variety of farming practices and I would like you to tell me if these practices increase, decrease or have no impact on climate change. **READ AND ROTATE LIST**

| | Increase | Decrease | No impact | Don't Know |
|---|---|---|---|---|
| Using conservation tillage (reduced/no tillage) | 1 | 2 | 3 | 9 |
| Summerfallow | 1 | 2 | 3 | 9 |
| Growing shelter belts | 1 | 2 | 3 | 9 |
| Allowing free range grazing (intensive grazing system) | 1 | 2 | 3 | 9 |
| Growing more forage and grass | 1 | 2 | 3 | 9 |
| Increased use of inorganic fertilizer | 1 | 2 | 3 | 9 |

**ASK ALL**

30. For each of the following statements, please indicate if you agree or disagree or don't know. The first statement is ..... **READ**

| | Agree | Disagree | Don't Know |
|---|---|---|---|
| The current focus on global warming is overdone | 1 | 2 | 9 |
| Farmers must take responsibility for reducing greenhouse gas | 1 | 2 | 9 |
| Canada should commit itself to reducing greenhouse gas | 1 | 2 | 9 |
| Canadian agriculture should commit itself to reducing greenhouse gas | 1 | 2 | 9 |
| Farming is too much of a struggle to allow climate change issues on the farm to be a priority | 1 | 2 | 9 |

***Intervention to Reduce Greenhouse Gas***

Ask only those who think there is a impact or don't know in 27b, otherwise skip to Q. 31b.

31. Should the government help the farm producer to reduce greenhouse gas?

| | | |
|---|---|---|
| Yes | .....1 | |
| No | .....2 | if no skip to 31b |
| Don't know | .....9 | **if Don't know skip to 31b** |

31a. What type of help or support should producers receive from the government to help them reduce greenhouse gas in the agricultural industry? **DO NOT READ LIST. RECORD FIRST MENTION AND OTHER MENTIONS. PROBE IF NOT MENTIONED:** Should they receive .. ? **READ AND ROTATE THOSE NOT ALREADY MENTIONED**

| | First mention | Other Mentions | Aided |
|---|---|---|---|
| Financial incentives | .....01..... | .....01..... | .....01..... |
| More information | .....02..... | .....02..... | .....02..... |
| Training | .....03..... | .....03..... | .....03..... |
| Emissions trading | .....04..... | .....04..... | .....04..... |
| Research | .....05..... | .....05..... | .....05..... |
| Regulation | .....06..... | .....06..... | .....06..... |
| Credit for building soil carbon | .....07..... | .....07..... | .....07..... |
| Other **(SPECIFY)** _____ | | | |
| Don't know | .....99..... | .....__..... | .....__..... |

**Ask all**

31b. Are you familiar with carbon sequestration or carbon sink farming practices that reduce Greenhouse Gas?

| | |
|---|---|
| Yes | .....1 |
| No | .....2 |
| Don't know/not stated | .....9 |

32a. On a 5-point scale, where 5 means you would be very willing and 1 means not at all willing, how willing would you be to voluntarily reduce greenhouse gas on your operation?

| | | |
|---|---|---|
| Not at all willing | .....1 | **- CONTINUE** |
| | .....2 | **- CONTINUE** |
| | .....3 | **- CONTINUE** |
| | .....4 | **- SKIP TO Q.35a** |
| Very willing | .....5 | **- SKIP TO Q.35a** |
| Don't know | .....9 | **- CONTINUE** |

32b. Using the same scale, how willing would you be to voluntarily reduce greenhouse gas on your operation if you received help from the government?

Not at all willing.....1
.....2
.....3
.....4
Very willing .....5
Don't know .....9

35a. If the producer had to adopt environmental farming practices to reduce greenhouse gas, what percentage of the cost should be paid by the producer?_____ %

**IF UNSURE, PROBE-** would it be...

0% .....1
1 - 4% .....2
5 - 10% .....3
11 - 25% .....4
26 - 50% .....5
51 - 75% .....6
More than 75% .....7
**DO NOT READ** Don't know/not stated.....9

36. Are you familiar with emissions trading markets?

Yes .....1
No .....2
Don't know/not stated.....9

**READ TO ALL** An emissions trading market is where producers can receive an annual cash benefit from other industries if they adopt certain farming practices which help to reduce Greenhouse Gas.

37a. **ASK IF DO NOT USE NO-TILL IN Q.11, OTHERWISE SKIP TO Q.38** If an emissions trading market was established in Canada where you would be paid **$3/acre** annually would you be very interested, moderately interested, somewhat interested, or not interested at all in adopting no-till to reduce Greenhouse gas **if "very interested" continue, if moderately ,somewhat, not interested or Don't know ask next level up (Rotate between 6$ and 10$ ASK MAXIMUM ONE LEVEL)**

Very interested .....
Moderately interested .....
Somewhat interested .....
Not interested at all .....
Don't know .....

37ai. What if you were paid $6/acre?

| | |
|---|---|
| Very interested | ..... |
| Moderately interested | ..... |
| Somewhat interested | ..... |
| Not interested at all | ..... |
| Don't know | ..... |

OR (in rotation with a)

37b. What if you were paid $10/acre?

| | |
|---|---|
| Very interested | ..... |
| Moderately interested | ..... |
| Somewhat interested | ..... |
| Not interested at all | ..... |
| Don't know | ..... |

Ask only those who said there was an impact or don't know in Q.27b, otherwise skip to Q39.

38. Which one of the following five government initiatives would be more likely to influence you in adopting farming practices to reduce Greenhouse gas on your farm operation? **ROTATE AND READ STATEMENTS. ACCEPT ONLY 1 RESPONSE**

| | |
|---|---|
| | Technical advice and support in adopting farming practices ..... 1 |
| | Creating an emissions trading market in Canada ..... 2 |
| | Investing more on research on agriculture and Greenhouse gas ..... 3 |
| | New regulations to reduce Greenhouse Gas ..... 4 |
| | Voluntary Programs ..... 5 |
| **DO NOT READ** | Don't Know/not stated ..... 9 |

39. Have you received any information on greenhouse gas emissions or climate change?

| | |
|---|---|
| Yes | .....1 |
| No | .....2 |
| Don't know | .....9 |

40. Are you interested in receiving factual information on greenhouse gas emissions from the government?

| | |
|---|---|
| Yes | .....1 |
| No | .....2 |
| Don't know | .....9 |

41. Are you interested in attending seminars or training courses on farming practices to help reduce greenhouse gas emissions?

| | |
|---|---|
| Yes | .....1 |
| No | .....2 |
| Don't know | .....9 |

## IMPACT OF CLIMATE CHANGE ON AGRICULTURE

Ask only those who said there was a impact or dk in 27a, otherwise skip to D1.

42. In your opinion, what do you think the impact of climate change will be on Canadian agriculture? Will it be .....? **READ LIST**

| | | |
|---|---|---|
| | Positive | 1 - CONTINUE |
| | Negative | 2 - CONTINUE |
| | Neutral | 3 - SKIP TO Q. D1 |
| DO NOT READ | Don't know | 9 - SKIP TO Q. D1 |

43. Please tell me if you believe climate change will result in the following environmental impacts?

| | Yes | No | Don't Know |
|---|---|---|---|
| Extreme weather | 1 | 2 | 9 |
| Dryer season | 1 | 2 | 9 |
| More flooding. | 1 | 2 | 9 |
| More drought. | 1 | 2 | 9 |
| Increased pests | 1 | 2 | 9 |
| Saving on heating | 1 | 2 | 9 |
| Introduction of new crop varieties | 1 | 2 | 9 |
| Expansion of planted area. | 1 | 2 | 9 |
| Longer growing season. | 1 | 2 | 9 |

### *Demographics*

Thank you for assisting us in this study. I have additional questions that will help us group your answers with those of other producers.

D1. First, how would you classify your farm operation? **READ LIST. RECORD ONE ONLY**

Sole proprietorship .....1
Corporation .....2
Partnership .....3
Cooperative or communal
operation (e.g., Hutterite colony) .....4
Other (**SPECIFY**)

_____

D2. For how many years have you been the main/joint decision-maker concerning your farm operation?

____ years

D3. What is the highest level of formal education that you have completed? **(READ LIST)**

Grade school or some high school .....1 - **SKIP TO Q.D5**
Complete high school.....2 - **SKIP TO Q.D5**
Technical, post secondary, including Ag Diploma....3 - **CONTINUE**
Some University degree program .....4 - **CONTINUE**
Complete University degree program .....5 - **CONTINUE**
Post graduate degree.....6 - **CONTINUE**

D4. Have you completed an Agriculture degree or diploma program, or both?

Agriculture degree.....1
Agriculture diploma.....2
Both .....3
Neither .....4

D5. And in what year were you born?_____

D6. What are the first 3 characters of your postal code?_____

D7. In the next 5 years do you plan to ...**(READ LIST. RANDOMIZE. RECORD ONLY ONE)** your farm operation?

Expand .....1
Maintain .....2
Reduce .....3

D8. Do you plan to retire from or quit farming in the next 5 years?

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't know | 3 |

D9. Thinking about last year, that is 2000, which category best describes the total farm sales you received in 2000, including government payments, but before deductions? Just tell me to stop when I reach the correct category. **RECORD ONE ONLY**

| | |
|---|---|
| $10,000 to $24,999 | 1 |
| $25,000 - $49,999 | 2 |
| $50,000 - $99,999 | 3 |
| $100,000 - $149,999 | 4 |
| $150,000 - $199,999 | 5 |
| $200,000 - $249,999 | 6 |
| $250,000 - $499,000 | 7 |
| $500,000 or more | 8 |
| Not stated/Refused | 9 |

**VERIFY TELEPHONE NUMBER**

**THANK YOU VERY MUCH FOR PARTICIPATING IN OUR STUDY.**